JAN 17 1934

Journal
of the
Association of American Medical Colleges

Volume 8 NOVEMBER, 1933 *Number 6*

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Published bimonthly, January, March, May, July, September and November, at 5 South Wabash Avenue, Chicago, Illinois, by the Association of American Medical Colleges. Subscription price, $3.00 per year. Single copies, 75 cents.

Entered as second class matter January 17, 1930, at the Post Office at Chicago, Illinois, under the Act of March 3, 1879.

(Continuing the Bulletin of the Association of American Medical Colleges)

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 8 NOVEMBER, 1933 Number 6

Inter-Institutional Cooperation and Research*

L. D. COFFMAN
President, University of Minnesota, Minneapolis

It would be presumptuous for me to undertake to define medical education to this body. I have been associated with the representatives of the medical profession long enough to know that a layman is not supposed to invade their sacred jurisdicitions. My contacts with professors and practioners of medicine have, however, taught me one valuable lesson. I am, as some of you may know, a student of pedagogy. I have devoted myself to the study of education and of educational processes. At times I have been greatly discouraged over the progress or rather lack of progress that we have made in the scientific study of education. So many questions are asked to which we do not know the answers. When I reach the depths of despair over the ignorance that prevails in the field of education and especially over my own ignorance, I have long made it a practice to visit the medical school. After I have listened to the doctors talk for an hour or so and have learned how little they actually know, I always go back strengthened and encouraged for my own work.

And, yet, I know that the members of the staff are earnest seekers after knowledge. I know, too, that a fine spirit of mutual respect exists among them when they talk in terms of knowledge and actual facts. They are not concerned with ancient trappings nor mystic rites; they are concerned with actual day-to-day performance and the continuing intellectual advancement of themselves and of their students. It is a matter of common knowledge that human learning moves forward with such speed that the daily plodder is soon lost in the march of progress. For generations we have applauded the man who sticks to his task or who faithfully and diligently does his duty. Now we know that these virtues are not sufficient. In addition to perseverance, there must be added a continuing desire to know.

One of the chief dangers a medical practitioner faces is that of failing to keep up his study. It must be easy for a doctor to fall prey to the lazy

*Presented at the executive session of the Forty-fourth Annual Meeting of the Association of American Medical Colleges, held in Rochester and Minneapolis, Minnesota, October 30, November 1, 1933.

habits of his profession. In the first few years out of school, while he is building up his practice, he has time for reflection, for reading and study. But as his practice develops he finds himself doing less and less reading and engaging in less and less study. Meantime, both the science and the practice of medicine are advancing. New technique for the study of medicine in its various applications are being devised, so that soon the young doctor finds that he not only does not read but that he cannot read the medical books and journals that come to his desk.

What I am saying does not apply to all doctors. There are always those rare souls who rise above circumstances and who keep themselves alive intellectually in spite of everything. The complaint that many a doctor makes is that he is too busy to keep abreast of the advancement in his field. He deludes himself with the illusion that if he paused for study his patients would suffer and, perhaps, die. He feels a certain ennoblement of character and strength of purpose as he dwells on these thoughts. He says that he does not propose to neglect his patients; as a result he stays by them to the bitter end.

The assumption that one is too busy to learn what is going on—an assumption which expresses itself in an exaggerated and sometimes distorted sense of duty—is not unfamiliar to a college president. He sees the same deading force at work within his own faculty. Aside from sheer ignorance and stupidity there is no force that so hinders and retards human progress as the alibi that one does not have time to keep himself informed.

I am reminded of an incident that occurred recently in a golf game I was playing. The players of the various foursomes were chosen by lot. Those comprising my foursome were strangers to each other. Before we teed off, the one with the lowest handicap, and easily the most talkative one of the group, gathered us into a huddle and said most impressively and in language which every golfer can understand, "Now, no alibis. An alibi," he said, "is like a jew's-harp; it is a noble instrument, but who in the heck wants to hear it."

No moralizing is needed to make plain the lesson of my golfer friend. I must add, however, that he failed to win a single hole all afternoon. He was so busy talking about the game—his game—that he broke every rule that Bobby Jones has described. Self-justification is a poor substitute for self-advancement. Not only does the man who uses it become increasingly less competent, but those whom he is serving or trying to serve are neglected because of his obtuseness.

A number of factors contribute to the situation which I am describing. One is the inherent disposition of men to slump when they are out on their

own, away from the stimulating influences of a university environment; another is the modern tendency toward specialization in all fields, including medicine. This tendency has so far invaded higher education that it is practically impossible for a student to get an overview of anything. If there is any synthesizing of knowledge it is quite as likely to be the result of accident as of intention. There is no such thing as a general or a liberal education anymore; students are exposed to attenuated and fragmentary bits of knowledge. Likewise, there is no such thing as the general study of medicine—at least not in the historical sense; medical learning has been so differentiated and split up that it is hard for a young man to become what is called "a doctor." I know full well that this tendency is what accounts for the great clinics that have been established in this country. They become absolutely necessary in view of the training that the neophytes receive in the medical schools.

Certain fundamental changes, however, are manifesting themselves here and there in the various provinces of medical education. One of them, perhaps, the most hopeful of them all, arises out of the application of scientific techniques to human problems generally. We are gradually learning that specialism carries its own limitations; it has its own dangers. Human knowledge cannot be separated and stored away in air-tight compartments. It cannot be split into unrelated segments. A specialist is a man whose learning is sharpened to a point. The broader the base, the less danger there is in the specialty; the narrower the base, the greater the danger. Some specialization is necessary, otherwise human progress would soon be resolved to the dead level of mediocrity. While I do not wish to be too critical of specialization, I do wish to emphasize the fact that in the final analysis all knowledge is related. Even the humanities and the natural sciences have their points of contact. The various sciences are so interlaced and interdependent that one cannot exist without the others.

This overlapping of the areas of human knowledge is shown best in research. Specialists in one field are finding that they cannot carry on without the assistance and advice of specialists in other fields. The pathologist calls for the help of the biochemist and of the chemist; the physiologist needs the aid of the biologist, the chemist, the physicist, and the botenist. We know now that disease in one part of the human anatomy may have its cause in some other part of the body. Furthermore, we know that the effects of disease may appear at remote places in the body, and sometimes years later. This accounts for the fact that we are insisting that dentists shall have the same fundamental scientific training as doctors of medicine, and also for the fact that researches in dentistry now involve a study of nearly every organ of the human body. A researcher in dentistry must now be a trained scientist.

It is my opinion that the next great steps forward will be made in the overlapping areas of human knowledge where scientists are working in close cooperation with each other. They will be made by those who, although specialists themselves, are trying to synthesize and bring together their separate points of view into a unified whole. I know that there will be an occasional genius living in an attic who will discover something worthwhile, but for the most part advances in knowledge will be the result of cooperation. They will be made where men in separated fields retain that mutual respect and confidence that true scientific men are supposed to possess, and where they work in close affiliation with each other.

The necessity that men pool their experiences is resulting or beginning to result in an allocation of research between institutions. No institution can carry on research along all lines. It has neither the money nor the men with which to do it. Poverty is teaching us a lesson we should have learned long ago, that is, that even in scientific effort men must work together and in cooperation. To do otherwise is to waste money and human effort. Our federal government has given us a fine illustration of how wasteful scientific enterprise may be. It scattered land-grant colleges and experiment stations across the country, one to each state, duplicating staff and equipment in areas where one well-equipped institution would do the work better than a half dozen. If we had four or five land-grant colleges, each concentrating on the needs of some typical region, we should, through the concentration of scientists at a few universities, stimulate greater intellectual effort and achieve more than we shall achieve by having forty-eight of them.

In a somewhat similar way there needs to be an allocation of research among institutions of first rank, including medical schools. A number of privately endowed medical schools have recognized the importance of this and have entered into a loose agreement as to the fields that they will emphasize. This plan prevents different institutions from calling upon the same donors for grants of money for the same purpose. That, of course, must be a relief to men of means who are constantly listening to pleas for money. But the chief benefit arises out of the fact that each of these institutions is gradually gathering into its folds an aggregation of scientists who are concentrating their attention upon the study of certain major problems that are not being emphasized nor being studies in like degree anywhere else. That does not mean that the more or less random or isolated scholar or scientist at some other institution of learning may not be at work upon some aspect of the general field that one of these institutions is emphasizing. If such a scholar exists and is found, he will be or should be quickly brought into cooperation with the group of scientists who are

concentrating their attention upon the more general field in which his problem lies.

What a tragic waste of money and human effort it is for cancer institutes, for example, to be endowed at each of the medical schools, or for any other type of special research institute to be endowed at the various medical schools across the country. There are not enough capable scientists, men of genuine talent and with a flare for research, to staff all these institutions. Important and fundamental as research is to human progress, and prodigal as we should be in the spending of money upon it, nevertheless we must admit that vast sums have been wasted and no doubt are now being wasted under the name of research. Subventions are granted to individuals who are incapable of carrying on research.

Research is, to a certain extent, an individual matter, but not wholly so. Due to the extreme specialization that now pervades every phase of our life, every scientist must seek the cooperation and assistance of other scientists in the elaboration of his hypotheses, in the conduct of his investigations, and in the verification and interpretation of his results. Research is, to a certain extent, also institutional. Over a period of years, given institutions take on a certain atmosphere; they devote themselves to certain lines of intellectual effort and become distinguished by their achievements along these lines. Now the time has arrived, I think, when we should think of research as being interinstitutional. Ways and means should be found of bringing the institutions themselves into closer relationships. There should be an interchange of research projects. A research program covering the interests and activities of a number of institutions should be devised and an organization set up for its continuance. That means the intelligence of the various institutions should be brought to bear upon the problems of a given institution. An individual carries on his investigations for the purpose of finding out the truth. An institution, likewise, is interested in the truth, but also in the utility or service value of its investigations; while any interinstitutional arrangement would focus its attention still more upon the social utility of the studies being pursued.

I have observed that medical schools are not only working in closer relationship with the scientific leaders of allied fields, but that here and there they have been adding a psychologist or a sociologist to their staffs. There is a growing recognition on the part of medical school leaders that the practice of medicine does not consist of sheer intellectual diagnosis and the dispensing of remedies. It has its psychological and sociological implications. A knowledge of psychology may not necessarily help the doctor to diagnose the difficult human situations in which he finds himself, but certainly it cannot hinder him. One may not see clearly the value of so-

ciology to medicine when he is a student in college but he will find later on that it impinges upon every phase of life.

It is my understanding that the representatives of this Association have been discussing a number of other matters of direct interest to medical education. One is the limiting of the number of entrants to medical schools. Educational leaders in each of the professions are saying that too many people are being educated. And the representatives of the various professions are now trying by various devices to establish themselves as cults with a view to limiting the number of noviates who may be allowed to enter. In other words, the effort to limit numbers is a protective device. It will be interesting to see how it develops. It finds considerable support on the part of the large taxpayer who does not want to support public education beyond the grades, but people in general, that is, the masses, are not so certain about it. I am of the opinion that among people in general it is creating much ill will.

Again, we must remember that it is not the cults nor the leaders in any of the professional or political lines that are in control today. It is the masses. They are in revolt; in revolt against their government, against those who say that too many people are being educated, against those who would limit the number admitted to medical schools, to law schools, or to any other type of school. Just the other day I heard Mr. Hopkins, the Federal Relief Commissioner, say to a meeting composed largely of laboring people and farmers: "We expect to make it possible for the farmer's children to go to college and to be admitted to any profession. We expect to make it possible for the laboring man's children to go to college and to be admitted to any profession. We expect to give to the sons and daughters of the farmers and the sons and daughters of the laboring people every opportunity and every advantage that has been enjoyed by the children of the man of means." Well, say what you will, these remarks were accompanied by loud applause from the audience.

Professional organizations are not merely trying to preserve themselves by limiting the number who may be admitted to practice, they are adopting regulatory laws of one kind and another with a view to raising standards and to controlling the training at the various educational institutions of this country. In other words, there is a nationwide movement which has found expression in practically all the professions to limit and to regiment the training of young people who may receive. A good illustration of what I am talking about is the experience that the University of Minnesota is having with the American Pharmaceutical Association. This Association has set up some sort of a national committee with power to investigate and examine schools of pharmacy to see whether

or not these schools measure up to the standards which this Association has set. This Association has set up an inspectorial system. We should have no particular objection to any visitor calling on us, but we do not like to feel that we must invite him to come. There is no need for any inquiry of our school being made. We know, as a matter of fact, that we have one of the best schools of pharmacy in America. Because we did not respond quickly to the suggestion that we invite some one to examine us, we were requested to send a representative to appear before a committee of this organization. He was taken severely to task for our attitude and we were politely informed that in case we refused to accede, we should be dropped from the Association and otherwise disciplined.

Only recently we were informed that the Embalmers' Examining Boards of the United States which, if I understand it correctly, is one of the beneficiaries of the medical profession, has set up some regulations. It specifies the number of hours that must be given in an embalming course, what the courses are, and it further stipulates that the institution offering these courses shall pay into the treasury of the Embalmers' Examining Boards $15 per student per course to help maintain the Association. And so one might go on through a long list of associations, pointing out detail after detail, form after form, prescription after prescription—all intended to regulate the professional schools of this country. I have long been of the opinion that professional bodies should concern themselves with the professional growth of their members and associates; that they should discuss problems that relate to human welfare; and that they should seek to devise forms of support for the advancement of those problems. I have likewise long believed that practically every move made by any outside organization with a view to regulating and controlling higher educational institutions of this country and to regimenting the students may be questionable. I recognize that there may be instances, of course, when something needs to be done, but I am confident that when actions of this sort prevent legitimate educational experimentation, then these associations have gone past the point of their greatest usefulness.

The masses are not only seeking additional opportunities for their children; they are, it must be admitted, lowering the standards of professional service at the same time. One sees this movement at its best, or worst, perhaps, I should say, when he notes what is happening to public school teachers. In thousands of places across this country we are selling our schools today to the lowest bidder, and we are saying at the same time that the schools are being maintained at full strength and without loss of efficiency. In my opinion, this lowering of standards of teachers and the social justifications that we are advancing for it, will have a deleterious

effect upon the standards of all other professions, including medicine and nursing. Demos is not well informed; it is more controlled by emotion than by intelligence. It refuses to recognize that all human progress has come from an intelligent aristocracy. We see how far the masses are prepared to carry their theories when we observe that a goat doctor was nearly elected Governor of Kansas, and that patent medicines of little value are being broadcast. Civilization is breaking at the point of lack of confidence in the expert. At the present moment nothing is stable in society. No one can tell what tomorrow's sun may bring. Everything is in a ferment. Practically all conduct is erratic and emotional.

The scholar, the scientist and the expert were never more needed and, aside from the attention they are reciving in certain political circles, were never listened to with less approval. Even in political circles the scholars who are trying to use their knowledge for the benefit of others, are referred to as members of the "Brain Trust," and often derisively. The American people still feel that most every one is qualified to do everything. This conception has been greatly accentuated in recent years. Its disintegrating effects are seen in the lowering of standards all along the line and in the counter movement on the part of professional practitioners to build walls around themselves in self-protection.

With society engaged in a gigantic effort to save itself by socializing itself, we may confidently expect that community and state medicine and other forms of socialized medicine will receive a new impetus. The medical profession is divided in its views on this subject. The recent report of the Committee on the Cost of Medical Care discusses this question at some length. There are those who are disposed to fight the movement to the bitter end as if that would solve the question. We must remember that we are living in new times and under changing conditions. Those who fail to recognize the tremendous power of the currents of social evolution that are fairly seething about them, are in danger of being swept aside without having made any contribution to the needs of a new day. Social medicine cannot be killed by fighting it. That will intensify the efforts of those who believe in it. For the doctors to try to build up principalities for themselves, regardless of what the masses think they need and wish, will not help the medical profession. A better way will be to recognize frankly that there will be more of social medicine in the future than in the past. That does not mean, however, that the representatives of the medical profession cannot educate the people to a higher type of medical service, to a type which the individual will demand for himself.

It is my opinion that medical training should be differentiated in terms

of the ability of the student and of the quality of service we have a right to demand of him. No incompetent and incapable student should be admitted to training, but all competent and capable students are not alike in ability. Some of them can be taught to render distinguished service of a high order. The program of training for the ablest may be ten, eleven or twelve years in length—the social and economic returns will justify such a program, and individuals will want the service of such men and will be willing to pay as generously as they can for it. The program for the less able but still serviceable individual should be less intensive and less extensive—there always has been, there always will be a place for him; individuals will desire his services for certain things and groups will employ him.

I should map out my program of medical education along these general lines, keeping in mind that there will always be a demand for individual service as well as for service for groups. By this plan I do not mean to imply for a moment that social medicine will be practiced by poorly trained people and individual medicine by highly trained people. I am confident that society does not require the same quality of service for all demands and that these differentiations should be given consideration.

Earlier in this paper I said something about doctors keeping themselves alive intellectually and professionally. Dr. Wilder of the Mayo Foundation, in a private conversation, recently suggested that all doctors in practice should be required to attend the university for a three months period once in four years. It was his opinion that the state could afford, in its own interest and that of the welfare of its people, to appropriate enough money to enable one-fourth of the doctors in practice to be housed and taught at the university each year. Such a plan would have two immediate effects; it would put the medical staff on its toes as nothing else would, and it would tone up the entire medical profession. It would rekindle the lamp of learning in many a mind where it has dimmed to a mere flicker.

Furthermore, the mere discussion of the importance of this or some similar plan, would have a most beneficial effect upon the public mind. Many of the problems with which we concern ourselves now, would seem trivial if we became genuinely interested in medicine for the sake of helping others.

I am confident that medical education will undergo some reorganization in the near future. A medical college will become a federation of medical schools. The medical cult will be less interested in its cultisms and more in the quality of professional service its members can render. Medical associations will have little or no interest in regulatory matters, but will have an enormous interest in the intellectual and scientific prob-

lems of medical theory and practice. The leadership of the doctor should be based upon intellect, skill and altruism, not upon rules and protective devices. Doctors in practice will not be permitted to vegetate and grow dull, incompetent and inefficient—they will be required, if for no other reason, to refresh themselves at some center of learning. Progress in medicine will not reside in administration but rather in scientific achievement and intellectual progress.

Perhaps, it may be said that all these things exist or are done now and that I have been building up straw men for the pleasure of destroying them. If that be true, then I ask your compassion for venturing to present the views of a layman, who should have had better judgment than to enter where angels dare to tread.

Study of Student Accomplishment in Seventy-nine Medical Schools of the United States

Freshman Class of 1932

FRED C. ZAPFFE

Secretary, Association of American Medical Colleges
Chicago

This is the fifth report on a study which the secretary was instructed to make by the Association. The study was begun in 1928 and its making has been fully justified by the interest taken in it by the liberal arts colleges. It was conceived by Dr. A. S. Begg, dean of Boston University School of Medicine. He presented the idea to the Association at its 1928 annual meeting, stating that such information, which had hitherto not been available, would be appreciated by the arts colleges as a means of checking up on those of their students who entered on the study of medicine. A motion to that effect, made by Dr. Begg was adopted and the secreary was insructed to go on with the work. It has been done for each year since then.

The present report is based on the accomplishment of the members of the 1932 freshman class. All the data are presented in the form of statistics as it cannot be done in any other way. Every one can read the ten tables and draw his own conclusions; however, it will not be amiss to refer briefly here to some of the outstanding points of interest in the study.

In the first place, this class is larger than the 1931 class by nearly 400 students, which is rather remarkable when one considers that a financial depression has been worrying us for some years and had just about reached its nadir in 1932 when these students entered medical schools. It is a fact, however, that attendance in professional schools has been in inverse ratio at all times to the fluctuations in business prosperity. Good business brings a lower attendance in professional schools; poor business increases such attendance. This report is proof of this statement.

The mortality of the freshman has always been about 15 per cent, more often a trifle less than more. The mortality of the 1932 class was 14.1 per cent as against 13.1 per cent in 1931 and 14.2 per cent in 1930.

The number of students with an encumbered record—conditions, failures, or both, and incompleted work—was considerably greater in 1932 than in the two previous years, and fewer students had a clear record. The percentages with an encumbered record were: in 1930, 18.6; in 1931, 17.2; in 1932, 18.6. In 1930, the per cent of those with a clear record was 68.5; 69.6 in 1931, and 67.2 in 1932. Economic conditions are again

strongly reflected in the greater number of withdrawals for financial reasons this year than in the previous two years. In 1930, only sixteen withdrawals for this reason were reported; 130 in 1931 and 178 in 1932. This group may be larger for each year than was definitely reported as a considerable number of withdrawals were reported "for other reasons" or "not stated" and some of these, at least, may have been for financial reasons. In this group there were 164 students in 1930, 96 in 1931 and 85 in 1932. In a few instances, the reason for withdrawal was stated as being "did not like medicine," "got married," "returned to college," "preferred some other field," etc. Only two students died in course in 1932 as against three in 1931. On the other hand, the withdrawals for poor or failing scholarship were greater in 1932 than in the previous two years: 54 in 1930, 87 in 1931 and 101 in 1932.

It is difficult to come to any conclusion as to the reason or reasons for these fluctuations, especially in view of the fact that medical schools are selecting students who have considerably more than the minimum of premedical work. More and more, preference is being shown to applicants who hold a bachelor's degree. The number with less than three years of premedical work has been growing smaller year by year since the first study of this kind was made. One would, naturally, expect that a student with more college work would do better in medical school than the student with less, yet the data presented in this study do not support such a supposition—as will be pointed out later in a discussion of the work done by each group. However, this is not the place for entering on a lengthy discussion of this problem as it would lead one too far afield and away from the objects of this study.

In 1930, 47.5 per cent of the matriculants held a bachelor's or other degree; in 1931, 51.5 per cent; in 1932, 52.7 per cent. The number of students with less than three years of premedical work has become less year by year since the first study was made, in 1928, when it was 22.9 per cent. In 1930, it was 19.5 per cent; in 1931, 19 per cent and in 1932, 16.5 per cent.

In the study now being made of applicants for admission to medical schools, it is evident that some students feel that more years of preparation gives greater assurance of acceptance by some medical school. Quite a few students who applied in 1932 with three years of preparation and who were refused admission, are applying again in 1933 with four years or a degree. Many of them are among the number who made many applications in each year. Of course, there is a possibility that some students who applied in 1932 with three years of preparation did so with the idea in mind of ascertaining whether acceptance would be forthcoming, and who,

nevertheless, had every intention of completing the work for a degree. That point can be cleared up only by writing to each applicant.

Tables 1, 2 and 3 present the data for the whole class in each of the medical schools reporting and they are of interest, primarily, to the individual schools. Table 3 emphasizes, again, that each school selects only the best of the students from its own university, and that those of its own university students who go to other medical schools than their own university school do not, on the whole, make as good a showing as do the students accepted by their own medical school.

Table 4 presents the data of accomplishment on the basis of entrance requirements. The students with only two years of premedical work did better work than any other group, except the A.B. students. Of the former, 13 per cent of the whole class, 68.6 per cent made a clear record; of the latter, 27.8 per cent of the whole class, 70.7 per cent made a clear record. Next come those with three years of prepration, 67 per cent making a clear record, and then the B. S. students, 66 per cent making a clear record. However, comparing the work of those who did not have a degree with those who had a degree, one find that the latter group had much the best of it in every way, as is shown in the summary.

Tables 5 and 6 complement table 2, by comparing the work of own university students with that of other university students. Here, too, the first named group shows up to much better advantage than does the second group by a considerable margin. This difference is especially notable in the numbers making a clear record and those who were definitely "out" at the end of the year: clear record, own university, 72.3 per cent; other university, 63.9 per cent; "out," own university, 10.7 per cent; other university, 16.6 per cent. These figures bear out the contention that the best students are kept at home, quite a natural procedure, but one which might prompt closer scrutiny of "other university" students applying for admission.

Table 7 presents the data on the women students of whom there were 323 in 1932 as against 271 in 1931. They do not appear to have done as well as the male students. The number making a clear record is slightly greater (68.1 per cent) than the same group of male students (67.2 per cent), but the percentage of "out" is considerably less for the males than for the females: 14.1 per cent as against 16.6 per cent. In 1931, the figures were more favorable to the women students than in 1932. The percentages were: clear record, 70.4; "out," 13.4.

Table 8 gives the data on the "repeaters." There were 282 students in this group as against 133 in 1931. The record for 1932 is far from being as good as the record made in 1931. Again, the question might be

asked whether repetition is justifiable, except in unusual cases. In 1931, 71.7 per cent made a clear record; in 1932, 61.3 per cent. In 1931, 8.4 per cent are reported as "out"; in 1932, 21.9 per cent, or nearly one fourth the group failed to make good on second trial.

Tables 9 and 10 present the data on the accomplishment of the students coming from approved and non-approved colleges. Each year fewer students from the non-approved colleges are accepted. There are definite reasons for the acceptance of such students. Some of these have nothing to do with scholarship. But, on the whole, the students accepted are what has often been termed "hand-picked"; that is, a very careful selection is made on the basis of scholarship. Therefore, it is expected that their work will be of a very high grade. It was not the case. Only 299 students came from the 129 non-approved colleges represented in the 1932 freshman class as against 439 in 1930 and 354 in 1931. Their records, on the whole, were not as good as those of the students coming from the approved colleges, as shown in the summary of tables 9 and 10, and it was decidedly worse in 1932 than it was in 1931. There were fewer clear records, more encumbered records and many more "outs." This is equally true of the group with less than a degree as it is of the degree holders.

In table 9, note the better accomplishment as to clear record of A. B. students and those with only two years of premedical work over all other groups. The three year group occupies third place, and the B. S. men fourth place. In the non-approved colleges group, the two years plus group is in first place, the A. B. men second, four years third and the B. S. men fourth.

In 1931, 612 colleges sent students into medical schools; in 1932, 594. In each year, about 38 per cent of the whole number sent five or more students into medicine. In 1932, 22 colleges for Negroes, 15 of them approved, were represented in the freshman class. It was impossible to compute the whole number of Negro students in the class, but 112 were registered in the two schools for Negroes—Howard and Meharry.

To carry this study further, an effort will be made to correlate the findings presented in this study with the medical aptitude test. The results will be published later.

Appended are the tables constructed from this study.

TABLE 1. ACCOMPLISHMENT OF 1932 FRESHMAN CLASS IN 79 MEDICAL SCHOOLS

Legends: Cl—Clear. Con.—Conditions. F—Failures. C & F—Conditions and failures. Inc.—Incomplete. Rpt.—Must repeat. Fd—Failed. Dr—Dropped. Withdrew: S—Scholarship. I-F—Illness or finances. OR—Other reasons (not stated).

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Alabama	58	38	9			1		2		2	5	1
Arkansas	57	30	11	1	1			7	2	2	3	
Medical Evangelists	104	72	13	1	5	1		5	2		4	1
California	63	50	13									
Southern California	54	44		4		1		2		1	2	
Stanford	52	45	3	2		1			1			
Colorado	63	39	4						16		3	1
Yale	*53											
Georgetown	160	137	9			1			5		6	2
George Washington	81	56	19						2		4	
Howard	55	26	10	2	3	4			9	1		
Emory	55	31	14	4	4			1				1
Georgia	40	31	5						3	1		
Loyola	150	98	11	2		3	1	15		11	3	6
Chicago Medical	67	38	4	10			4			1	9	1
Northwestern	125	85	9	6	3	13	1		2	2	4	
Chicago	81	52		18		11						
Illinois	178	97		51		5		22				3
Indiana	123	99	5			7		8		1	3	
Iowa	126	89	12			3	3	1	5	5	7	1
Kansas	73	58		5		4			3		2	1
Louisiana	66	30	6			4	5		4	4	8	5
Tulane	135	54	51			1	1	2	7	13	6	
Louisville	95	67		8			3		8	6	3	
Johns Hopkins	*71											
Maryland	121	76	17			3	6		14		5	
Boston	70	65				1		2	1			1
Harvard	125	113		1		1				6	1	3
Tufts	129	102		17					4		6	
Detroit	100	71	15		8			1	1		2	2
Michigan	131	86	24			8			4	4	5	
Minnesota	121	76				12		33				
Mississippi	22	21	1									
St. Louis	173	69	27	6	34	2		2	24		8	1
Missouri	44	30	7	1				4	1		1	
Washington	81	68	3	1					5			4
Creighton	102	49	25	2	2	1	2	12			6	3
Nebraska	101	74		3			2	7		8	7	
Dartmouth	22	18	1					2			1	
Albany	36	17		12				5			2	
Columbia	115	98	2	5					5	3	1	1
Cornell	53	43	4						5		1	
Long Island	113	77	29				2		4		1	
New York Homeopathic	96	67		19		1		3	2			4

*Credits are not given until end of sophomore year.

TABLE 1—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Syracuse	52	43	7						2			
New York University	145	99	22			3		14			7	
Buffalo	79	53	14	1	2	2			7			
Rochester	42	32	4	4		1			1			
Duke	48	37		4		3			4			
North Carolina	33	25	3					2	2		1	
Wake Forest	30	22	5					1			2	
North Dakota	29	27		1						1		
Ohio	100	71	1	16				1	7	1	3	
Cincinnati	90	56	15	1		2		1	4	6	5	
Western Reserve	79	52	13			1	3		6	1	1	2
Eclectic M. C.	38	13	14		1				8	1	1	
Oklahoma	78	52				1	6	13	3		1	2
Oregon	66	46	12	1	2				3		2	
Hahnemann	142	88		39								15
Jefferson	159	113	17					20	2	6		1
Temple	115	75	29					10			1	
Pennsylvania	131	100		23		1		4	2	1		
Pittsburgh	67	61		3					3			
Woman's	44	32	4	1			3		1	1	1	1
South Carolina	40	34	5								1	
South Dakota	30	18				8		1	1		1	1
Meharry	57	25		22			3		1	1	5	
Vanderbilt	50	40		4		1		1		2	1	1
Tennessee	† 119	79	14	3				18			3	2
Baylor	118	51	29	4	4			16		4	6	4
Texas	100	60	22						8		8	2
Utah	35	23	11								1	
Vermont	44	42		1							1	
Virginia	72	39	16	2	11							4
Med. Coll. of Virginia	79	46	15			1			14	2		1
West Virginia	80	50		2				18	2		2	6
Marquette	92	75						4	8	2	3	
Wisconsin	120	61	4	4		42	3		4		1	1

TABLE 2. ACCOMPLISHMENT OF 1932 FRESHMAN CLASS IN 79 MEDICAL SCHOOLS.
First Line: Own University Students.
Second Line—Students from Other Universities.

Legends: Cl—Clear. Con.—Conditions. F—Failures. C & F—Conditions and failures. Inc.—Incomplete. Rpt.—Must repeat. Fd—Failed. Dr—Dropped. Withdrew: S—Scholarship. I-F—Illness or finances. OR—Other reasons (not stated).

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Alabama	29	19	6	1						1	2	
	29	19	3			1		1		1	3	1
Arkansas	10	9							1			
	47	21	11	1	1			7	1	2	3	
Medical Evangelists	104	72	13	1	5	1		5	2		4	1

† Tennessee is on the straight quarter system—hence some of the students reported on have completed 3 quarters, some only 2 quarters or two-thirds of a college year.

TABLE 2—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Stanford University	26	24	1			1						
	26	21	2	2					1			
California	29	25	4									
	34	25	9									
Southern California	27	21		3				1			2	
	27	23		1		1		1		1		
Colorado	28	21	2						5			
	35	18	2						11		3	1
Yale *												
George Washington	43	35	5								3	
	38	21	14						2		1	
Georgetown	30	26	2								1	1
	130	111	7			1			5		5	1
Howard	34	17	7	2	2	1			4	1		
	21	9	3		1	3			5			
Georgia	16	11	2						3			
	24	20	3							1		
Emory	25	12	8	2	2							1
	30	19	6	2	2			1				
Northwestern	30	22	1	1	1	5						
	95	63	8	5	2	8	1		2	2	4	
Illinois	43	32		9				2				
	135	65		42		5		20				3
Loyola	52	34	5	1		2	1	3			2	4
	98	64	6	1		1		12		11	1	2
Chicago	37	22		10		5						
	44	30		8		6						
Indiana	79	60	2			7		7			3	
	44	39	3					1		1		
Iowa	50	40	5			1			3			1
	76	47	7			2	3	1	2	5	7	
Kansas	47	39		4		3			1			
	26	19		1		1			2		2	1
Louisville	35	23		4			2		3	2	1	
	60	44		4			1		5	4	2	
Louisiana	15	8					3		2	1	1	
	51	22	6			4	2		2	3	7	5
Tulane	53	27	21			1				1	3	
	82	27	30				1	2	7	12	3	
Johns Hopkins	*15											
	56											
Maryland	47	34	7			2	2		1		1	
	74	42	10			1	4		13		4	
Boston	11	10							1			
	59	55				1		2				1
Harvard	35	32		1		1						1
	90	81								6	1	2
Tufts	36	32		2					1		1	
	93	70		15					3		5	
Michigan	91	67	10			7			3	1	3	
	40	19	14			1			1	3	2	
Detroit	55	41	8		3				1		1	1
	45	30	7		5			1			1	1
Minnesota	74	51				6		17				
	47	25				6		16				

*Promotion examination given at end of sophomore year.

TABLE 2—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Mississippi	11	10	1									
	11	11										
Missouri	28	21	2	1				4				
	16	9	5						1		1	
Washington	31	24	3						4			
	50	44		1					1			4
St. Louis	46	15	5	2	10	1			11		2	
	127	54	22	4	24	1		2	13		6	1
Nebraska	56	45					2	2		4	3	
	45	29		3				5		4	4	
Creighton	34	18	8	1	1		1	1			2	2
	68	31	17	1	1	1	1	11			4	1
Dartmouth	19	17	1								1	
	3	1						2				
Long Island												
	113	77	29				1		5		1	
Albany	16	7		6				2			1	
	20	10		6				3			1	
Buffalo	40	30	7			1			2			
	39	23	7	1	2	1			5			
Cornell	8	5	2						1			
	45	38	2						4		1	
New York University	59	49	7			1		2				
	86	50	15			2		12			7	
New York Homeopathic												
	96	67		19		1		3	2			4
Columbia	40	37	2						1			
	75	61		5					4	3	1	1
Syracuse	44	37	5						2			
	8	6	2									
Rochester	7	6		1								
	35	26	4	3		1			1			
North Carolina	24	20	2						1		1	
	9	5	1					2	1			
Wake Forest	27	19	5					1			2	
	3	3										
Duke	18	13		2		1			2			
	30	24		2		2			2			
North Dakota	16	14		1						1		
	13	13										
Cincinnati	50	32	9	1				1	4		3	
	40	24	6			2				6	2	
Western Reserve	25	20	2			1			2			
	54	32	11				3		4	1	1	2
Ohio	64	49		8					3	1	3	
	36	22	1	8				1	4			
Eclectic M. C.												
	38	13	14		1				8	1	1	
Oklahoma	48	34				1	5	6				2
	30	18					1	7	3		1	
Oregon	28	17	6	1					3		1	
	38	29	6		2						1	
Pennsylvania	51	46		1				3		1		
	80	54		22		1		1	2			
Woman's												
	44	32	4	1			3		1	1	1	1
Jefferson												
	159	113	17					20	2	6		1

TABLE 2—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Hahnemann												
	142	88		39								15
Pittsburgh	47	43		2					2			
	20	18		1					1			
Temple	29	27	2									
	86	48	27					10			1	
South Carolina	7	7										
	33	27	5								1	
South Dakota	13	10				3						
	17	8				5		1	1		1	1
Vanderbilt	11	9				1		1				
	39	31		4						2	1	1
Meharry												
	57	25		22			3		1	1	5	
Tennessee	55	36	11					8				
	64	43	3	3				10			3	2
Baylor	21	11	6	2				2				
	97	40	23	2	4			14		4	6	4
Texas	54	40	11						2		1	
	46	20	11						6		7	2
Utah	32	22	9								1	
	3	1	2									
Vermont	35	34		1								
	9	8									1	
Virginia	46	25	8	2	7							4
	26	14	8		4							
Medical College Virginia												
	79	46	15			1			14	2		1
Wisconsin	110	56	4	3		39	3		3		1	1
	10	5		1		3			1			
Marquette	58	50							6		1	1
	34	25						4	2	1	2	
West Virginia	61	42						13	2		1	3
	19	8		2				5			1	3
Chicago Medical School												
	67	38	4	10			4			1	9	1

TABLE 3—ACCOMPLISHMENT OF 1932 FRESHMAN CLASS IN 68 UNIVERSITY MEDICAL SCHOOLS

First Line—Own Students in Own Medical School.
Second line: Own Students in Other Medical Schools.

Legends: Cl—Clear. Con.—Conditions. F—Failures. C & F—Conditions and failures. Inc.—Incomplete. Rpt.—Must repeat. Fd—Failed. Dr—Dropped. Withdrew: S—Scholarship. I-F—Illness or finances. OR—Other reasons (not stated).

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Alabama	29	19	6	1						1	2	
	37	15	6	1	1			2	6	3		3
Arkansas	47	21	11	1	1			7	1	2	3	
	5	3		1							1	
Stanford	26	24	1			1						
	36	26	3	2	1			1	1			2
California	29	25	4									
	45	34	4	3	2				2			
Southern California	27	21		3				1			2	
	17	11	3	1							1	1

TABLE 3—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Colorado	28	21		2					5			
	2	1	1									
Yale	*53											
George Washington	43	35	5								3	
	9	5		1					1		1	1
Georgetown	30	26	2								1	1
	13	4	2	1			1	2	1		2	
Howard	34	17	7	2	2	1			4	1		
	3	3										
Georgia	16	11	2						3			
	13	5	2	2	1				1	2		
Emory	25	12	8	2	2							1
	9	6	2							1		
Northwestern	30	22	1	1	1	5						
	19	13	2	2		1		1				
Illinois	43	32		9				2				
	29	20	2	3	1	1			1	1		
Loyola	52	34	5	1		2	1	3			2	4
	8	6						1			1	
Chicago	37	22		10		5						
	35	21	1	7		1	1	2		1		1
Indiana	79	60	2			7		7			3	
	8	2	2					1	2		1	
Iowa	50	40	5			1			3			1
	16	9	3		1				1			2
Kansas	47	39		4		3			1			
	12	6	2		1			1		2		
Louisville	35	23		4			2		3	2	1	
	5	3	1						1			
Louisiana	15	8					3		2	1	1	
	4	2	1							1		
Tulane	53	27	21			1				1	3	
	6	4				2						
Johns Hopkins	*15											
	28	17	4						3	1	3	
Maryland	47	34	7			2	2		1		1	
	6	3	1			1		1				
Boston	11	10							1			
	3	3										
Harvard	35	32		1		1						1
	38	27	2	3		2		1	2			1
Tufts	36	32		2					1		1	
	7	5		2								
Michigan	91	67	10			7			3	1	3	
	39	31	2	2			1	1	2			
Detroit	55	41	8		3				1		1	1
	8	2	4	1						1		
Minnesota	74	51				6		17				
	10	5	2			1			1	1		
Mississippi	11	10	1									
	2	2										
Missouri	28	21	2	1				4				
	10	7	2	1								
Washington	31	24	3						4			
	6	4			1					1		

*Promotion examination given at end of sophomore year.

TABLE 3—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
St. Louis	46	15	5	2	10	1			11		2	
	3		1					1			1	
Nebraska	56	45					2	2		4	3	
	1	1										
Creighton	34	18	8	1	1		1	1			2	2
	10	6	1					1		1	1	
Dartmouth	19	17	1								1	
	25	23		1								1
Albany	16	7		6				2			1	
	9	6	2						1			
Buffalo	40	30	7			1			2			
	1	1										
Cornell	8	5	2						1			
	49	35	4	3	1	2			2		2	
New York University	59	49	7			1		2				
	94	83	6	3					1			1
Columbia	40	37	2						1			
	58	45	6		1	2			3	1		
Syracuse	44	37	5						2			
	15	9	1	2					1			2
Rochester	7	6		1								
	5	5										
North Carolina	24	20	2						1		1	
	17	8	2	1	2			1	1		1	
Wake Forest	27	19	5					1			2	
	2	1						1				
Duke	18	13		2		1			2			
	20	15	2		1			2				
North Dakota	16	14		1						1		
	3	2							1			
Cincinnati	50	32	9	1				1	4		3	
	12	4	7							1		
Western Reserve	25	20	2			1			2			
	13	7	3	1				1	1			
Ohio	64	49		8					3	1	3	
	37	29	3						2	1		2
Oklahoma	48	34				1	5	6				2
	8	3	4								1	
Oregon	28	17	6	1					3		1	
	7	2	1	1				2			1	
Pennsylvania	51	46		1				3		1		
	56	48	4	2				1				1
Pittsburgh	47	43		2					2			
	61	42	6	2				6	2	2		1
Temple	29	27	2									
	16	13	2						1			
South Carolina	7	7										
	4	1	2							1		
South Dakota	13	10				3						
	5	3					1		1			
Vanderbilt	11	9				1		1				
	14	8	2				1				2	1
Tennessee	55	36	11					8				
	2	1									1	
Baylor	21	11	6	2				2				
Texas	54	40	11						2		1	
	36	16	7		1	1		3	3	2	1	2

TABLE 3—Continued

	Total	Cl.	Con.	F	C & F	Inc.	Rpt.	Fd.	Dr.	Withdrew S	Withdrew I-f	Withdrew OR
Utah	32	22	9								1	
	4	2					1				1	
Vermont	35	34		1								
Virginia	46	25	8	2	7							4
	12	10		2								
Wisconsin	110	56	4	3		39	3		3		1	1
Marquette	58	50							6	1	1	
	3					1			1		1	
West Virginia	61	42						13	2		1	3
	8	6	1				1					

TABLE 4—DATA ON ACCOMPLISHMENT OF STUDENTS FROM ALL SCHOOLS ON BASIS OF ENTRANCE CREDENTIALS

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2 yrs.	842	578	72	34	7	23	5	52	22	17	20	12
%	13.0	68.6										
2 +	287	178	41	9	3	7	6	8	17	9	8	1
%	4.4	62.0										
3 yrs.	1461	980	165	65	28	40	7	55	48	9	44	20
%	22.6	67.0										
3 +	303	194	38	12	8	8	2	11	12	7	7	4
%	4.7	64.0										
4 yrs.	286	154	30	24	4	15	6	17	13	4	10	9
%	4.4	53.8										
AB	1797	1272	155	70	15	38	16	53	80	30	48	20
%	27.8	70.7										
BS	1352	903	138	94	16	19	6	57	44	24	32	19
%	20.9	66.0										
PHG	44	27	6	3	—	1	—	3	1	—	3	—
PHC												
%	0.7	61.3										
Other DEGR.	85	53	8	6	—	4	—	4	3	1	6	—
%	1.3	62.3										
TOTALS	6457	4339	653	317	81	155	48	260	240	101	178	85
%		67.2	10.1	4.9	1.2	2.4	0.7	4.0	3.8	1.5	2.9	1.3

SUMMARY

Total Number of Students	6457	
Clear record	4339	67.2
Conditions	653	10.1
Failures	317	4.9
Conditions & Failures	81	1.2
Incompleted work	155	2.4
	1206	18.6

Must repeat	48	0.7
Failed	260	4.0
Dropped	240	3.8
Withdrew	364	5.6
Scholarship 101—1.5	912	14.1
Illness or Finances 178—2.9		
Other reasons 85—1.3		

	No degree	Degree
Total Number of Students	3179—49.3	3278—50.7
Clear record	2084—65.5	2255—68.8
Encumbered record	633—19.9	573—17.4
Out	462—14.5	450—13.7

TABLE 5—DATA ON ACCOMPLISHMENT OF STUDENTS FROM OWN UNIVERSITY ON BASIS OF ENTRANCE CREDENTIALS

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2 yrs.	512	381	46	11	4	15	3	18	11	7	9	7
2 +	108	73	13	1	2	2	1	2	8	2	3	1
3 yrs.	808	590	69	24	14	33	4	28	21	2	17	6
3 +	146	97	14	7	1	8	1	8	3	3	3	1
4 yrs.	132	83	11	5	1	9	5	8	6	1	2	1
AB	515	383	40	17	3	18	4	14	21	2	10	3
BS	241	175	23	12	2	6	1	4	9	—	7	2
PHG												
PHC	20	13	6	—	—	—	—	1	—	—	—	—
O. D.	11	8	1	1	—	—	—	—	1	—	—	—
Total	2493	1803	273	78	27	91	19	83	80	17	51	21
%		72.3	8.9	3.1	1.1	3.6	0.6	3.3	3.2	0.7	2.0	0.9

TABLE 6—DATA ON ACCOMPLISHMENT OF STUDENTS FROM OTHER UNIVERSITIES ON BASIS OF ENTRANCE CREDENTIALS.

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2 yrs.	330	197	26	23	3	8	2	34	11	10	11	5
2 +	179	105	28	8	1	5	5	6	9	7	5	—
3 yrs.	653	390	96	41	14	7	3	27	27	7	27	14
3 +	157	97	24	5	7	—	1	3	9	4	5	2
4 yrs.	154	71	19	19	3	6	1	9	7	3	8	8
AB	1282	889	115	53	12	20	12	39	59	28	38	17
BS	1111	728	115	82	14	13	5	53	35	24	25	17
PHG												
PHC	24	14	—	3	—	1	—	2	1	—	3	—
O. D.	74	45	7	5	—	4	—	4	2	1	5	1
Totals	3964	2536	430	239	54	64	29	177	160	84	127	64
%		63.9	10.8	6.0	1.1	1.6	0.7	4.7	4.3	2.1	3.2	1.6

SUMMARY
(Tables 5 and 6)

	Own University	Other Universities
Total	2493	3964
Clear Record	1803—72.3	2536—63.9
Encumbered Record	419—16.7	787—19.5
Out	271—10.7	641—16.6

TABLE 7—DATA ON ACCOMPLISHMENT OF WOMEN STUDENTS IN 79 MEDICAL SCHOOLS

A—OWN UNIVERSITY

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2 yrs.	13	11	1	—	—	—	—	1	—	—	—	—
2 +	3	3	—	—	—	—	—	—	—	—	—	—
3 yrs.	22	17	1	—	—	1	1	1	1	—	—	—
3 +	8	4	2	—	—	1	—	—	—	1	—	—
4 yrs.	4	3	—	—	—	—	—	—	—	1	—	—
AB	39	29	3	2	—	—	—	1	1	1	2	—
BS	9	2	1	2	—	2	—	1	—	—	1	—
O.D.	1	1	—	—	—	—	—	—	—	—	—	—
Totals	99	70	8	4	—	4	1	4	2	3	3	—
%		70.7	8.0	4.0	—	4.0	1.0	4.0	2.0	3.0	3.0	—

B—OTHER UNIVERSITY

2 yrs.	25	13	—	—	—	1	1	8	—	1	—	1
2 +	1	1	—	—	—	—	—	—	—	—	—	—
3 yrs.	8	4	1	—	—	2	—	—	1	—	—	—
3 +	32	18	5	—	—	—	3	—	1	—	3	2
4 yrs.	2	2	—	—	—	—	—	—	—	—	—	—
AB	99	72	8	2	—	2	1	4	3	2	4	1
BS	42	29	7	1	1	2	—	—	—	1	—	1
O.D.	15	11	—	—	—	1	—	1	1	—	1	—
Totals	224	150	21	3	1	8	5	13	6	4	8	5
%		67	9.4	1.3	0.4	3.7	2.3	5.8	2.7	1.8	3.7	2.3
Totals for both groups	323	220	29	7	1	12	6	17	8	7	11	5
%		68.1	9.0	2.2	0.3	3.7	1.8	5.3	2.4	2.2	3.4	1.2

SUMMARY

Total No. Women Students	323	
Clear Record	220	68.1
Encumbered Record	49	15.2
Out	54	16.6

	Own University		Other Universities	
Total	99		224	
Clear Record	70	70.7	150	67.0
Encumbered Record	16	16.0	33	13.8
Out	13	13.0	41	18.6

TABLE 8—DATA ON ACCOMPLISHMENT OF REPEATERS

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2 yrs.	60	32	3	5	—	3	1	8	1	—	7	—
2 +	28	20	2	—	—	—	—	2	1	1	2	—
3 yrs.	58	31	10	2	—	2	1	7	3	—	2	—
3 +	11	3	3	—	—	—	—	1	4	—	—	—
4 yrs.	33	21	1	4	—	—	1	3	3	—	—	—
AB	54	40	2	1	—	1	—	5	3	—	—	2
BS	32	22	—	4	2	—	—	1	1	—	2	—
O.D.	6	4	1	—	—	1	—	—	—	—	—	—
Totals	282	173	22	16	2	7	3	27	16	1	13	2
%		61.3	7.8	5.7	0.7	2.4	1.0	9.5	5.7	0.4	4.6	0.7

SUMMARY

Total No. Repeaters	282	
Clear Record	173	61.3
Encumbered Record	47	16.6
Out	62	21.9

TABLE 9—DATA ON ACCOMPLISHMENT OF STUDENTS FROM APPROVED COLLEGES ON BASIS OF ENTRANCE CREDENTIALS

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2-yrs.	796	554	67	34	6	20	5	47	20	14	19	10
%	12.9	69.6										
2 +	261	161	37	9	3	6	6	7	16	7	14	1
%	4.2	61.6										
3 yrs.	1396	950	153	62	24	37	6	51	44	9	42	18
%	22.7	68.0										
3 +	286	187	36	10	8	8	2	9	8	7	8	3
%	4.6	65.4										
4 yrs.	271	146	29	22	4	15	6	17	13	4	9	9
%	4.6	53.9										
AB	1740	1236	151	65	14	38	15	50	80	29	43	19
%	28.2	71.0										
BS	1284	868	130	89	16	19	3	41	41	22	26	17
%	20.8	67.6										
PHG												
PHC	44	27	6	3	—	1	—	3	1	—	3	—
%	0.7	61.4										
O.D.	80	48	8	6	—	4	—	4	3	1	4	1
%	1.4	60.0										
Totals	6158	4177	617	300	75	147	43	239	226	93	162	78
%		67.5	10.0	4.8	1.2	2.2	0.7	3.9	3.7	1.5	2.6	1.3

TABLE 10—DATA ON ACCOMPLISHMENT OF STUDENTS FROM NON-APPROVED COLLEGES ON BASIS OF ENTRANCE CREDENTIALS

Entr. Cred.	Total No.	Cl	Con	F	C&F	Inc	Rpt	Fd	Dr	S	Withdrew I-F	Withdrew O.R.
2 yrs.	46	24	5	—	1	3	—	5	2	3	1	2
%		52.2										
2 +	26	17	4	—	—	1	—	1	1	2	—	—
%		65.4										
3 yrs.	65	30	12	3	4	3	1	4	4	—	2	2
%		46.1										
3 +	17	7	2	2	—	—	—	2	4	—	—	—
%		41.2										
4 yrs.	15	8	1	2	—	—	—	3	—	—	1	—
%		53.3										
AB	57	36	4	5	1	—	1	3	—	1	5	1
%		63.1										
BS	68	35	8	5	—	1	3	3	3	2	6	2
%		51.5										
O.D.	5	4	—	—	—	—	—	—	—	—	1	—
%		80										
Totals	299	161	36	17	6	8	5	21	14	8	16	7
%		53.8	12.0	5.7	2.0	2.6	1.7	7.0	4.7	2.6	5.3	2.4

SUMMARY

(Tables 9 and 10)

	Approved Colleges	Non-Approved Colleges
Total No. Students	6158—95.4	299—4.6
Clear Record	4177—67.5	161—53.8
Encumbered Record	1139—18.5	67—22.4
Out	841—13.4	71—23.7

	Approved Colleges	Non-Approved Colleges
No Degree—Total	3010	169
Clear Record	1998—66.3	86—50.9
Encumbered Record	580—19.3	43—25.4
Out	428—14.2	40—23.7
Degree—Total	3148	130
Clear Record	2179—69.2	75—57.7
Encumbered Record	550—17.4	24—18.5
Out	406—12.8	31—23.8

Total No. Colleges	594
Approved Colleges	465
Non-Approved Colleges	129

Total No. Negro Colleges	22
Approved Colleges	15
Non-Approved Colleges	7

A Study of the Selective Admission of Students in the Medical Schools of the University of Chicago

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Introduction

The problem of the selection of students in any professional school is closely tied up with the standards of attainment which that school sets for its graduates. For the last twenty-five years a strenuous effort has been made by the American Medical Asociation and the Association of American Medical Colleges to raise the standards of the medical profession with the result that many mediocre and low grade medical schools have gone out of existence and those which remain have continuously improved. During this period of elevation of standards, admission requirements have been made more and more strict until at present, two years is the minimum amount of college training required for admission to Class A medical schools of which there are now seventy-six in the United States offering first year medical work. Eight of these now require their candidates for admission to have a Bachelor's degree or to arrange with the institution from which they come to grant one on completion of one year of medicine; nineteen require three years of college work and the other 49 from two to two and one-half years. In addition to the college training, the applicant must show that he is capable of a high type of scholarship and that he has personal traits which will fit him for the practice of medicine. The Medical Schools of the University of Chicago have cooperated in raising the standards for graduates and in making a careful selection of entrants.

There is always the possibility, where standards of admission are being raised, that certain important elements of success may be omitted from the requirements and other factors not so important in attaining success may be over-emphasized. The purpose of this study is to discover what qualities, which can be estimated at the time of application, are most indicative of future success in the study of medicine and to offer suggestions for selecting students who possess them.

The Medical Schools of the University of Chicago include (1) Rush Medical College, (2) The School of Medicine of the Division of the Biological Sciences. These are being unified. Work is offered leading to the degrees of Doctor of Medicine, Master of Science and Doctor of Philosophy. Candidates for the degree of M.D. do the first two years in the School of Medicine of the Division of the Biological Sciences on

the University Quadrangles. The third and fourth years may be done either in the School on the Quadrangles or in Rush Medical College. The requirement for the fifth year may be satisfied by a year of advanced work in some branch of medical science, or by a year of successful internship in an approved hospital.

Until June, 1902, a student was eligible for admission to the Medical Schools if he had graduated from an approved high school with fifteen units of credit distributed as follows: English 2, history 1, Latin 2, mathematics 2½, physics 1, chemistry 1, and electives 5½.

Beginning with 1902, the quantitative admission requirements were gradually raised until in 1924 only those holding a standard Bachelor's degree, or the equivalent, were eligible to be considered for admission. During this period many changes were made in the qualitative requirements. The language requirement changed from Latin to a reading knowledge of German or French. The requirement in science became a little less specific but a larger amount was included. A minimum scholarship average was set. Personal qualifications became an important consideration.

In 1932, the amount of college work was reduced from four to three years and requirements in science became more specific. The announcement has been made that beginning with the Autumn of 1934 a reading knowledge of German will be required instead of a choice between German and French.

THE PROBLEM

The first-year class in the Medical Schools of the University of Chicago is limited to 110 students. In the Junior year, the number is increased to 140 by taking additional students who have completed the first two years of medicine elsewhere. This makes approximately 150* students who may be admitted in any one year. There are about 750 applicants or about five times as many as can be accepted. This presents the problem of determining, as far as possible, the best method of selecting the small number to be admitted from the large number who apply.

This study is necessarily limited in scope because many facts which should be considered in a scheme of selective admissions are not available and many facts which are available do not lend themselves to quantitative treatment. The Commission on Medical Education in its second report, dated January, 1928, gives the following nine items which should be considered in the selection of medical students:

1. Scholarship in premedical work.
2. Personality.
3. Environment from which applicant comes.

* The increase takes care of withdrawals during the first two years.

4. Extent to which the student has shown characteristics of independent thought and leadership.
5. Points other than mere scholarship which indicate mental capacity and a good background.
6. Subjects taken in premedical training.
7. Success in different subjects of premedical education—high success in chemistry and biology is desirable while little correlation between success in the languages, literature and the social sciences and success in the medical subjects is expected.
8. Letters from applicant's former professors in the natural sciences expressing their opinions as to his diligence, personality, attitude toward his work, and his ambitions.
9. Outstanding work in some one special field.

We shall be content if in this study we can find the answers to the following questions:

1. Is there any relation between age and success in the medical schools?
2. What is the relationship between scholarship in premedical courses and in later medical courses? Is the relationship any more pronounced when only the natural sciences in the premedical courses are considered than when all subjects are considered?
3. Does the type of institution in which the premedical education is pursued have an important bearing on success in the study of medicine?
4. Do students who have had three, four or more years of premedical education tend to succeed better than those who have had only two years?
5. Is the amount of natural science in premedical work related to success in the study of medicine? Are certain natural sciences any more beneficial than others?

CRITERIA OF SUCCESS

Success in the medical schools is best measured by the success of the graduates after they leave school. Unfortunately, a study which is limited in time and resources cannot employ this criterion. Furthermore, criteria of this sort are somewhat lacking in objectivity and all judges would not agree on the relative success of the various graduates in actual practice. More tangible and more accessible criteria will, therefore, have to be used. The three following criteria seem to be the most logical and practical for our purpose.

1. *Scholarship.*—Instructors' marks, even though not as reliable as one could wish, are probably the best criterion of success that is obtainable.

They are a better criterion in medical schools like those of the University of Chicago where clinical training is given in small groups under conditions closely approximating those of actual practice of medicine. In these small groups instructors know their students well and give grades representing success in actual clinical work with patients.

2. *Progress Through the Course.*—Continuity of study from matriculation to graduation seems to be another legitimate criterion of success. Voluntary or involuntary withdrawals are undesirable. As far as possible, students should be selected who can complete the entire program of study leading to the medical degree. Graduation should be the least of the possible attainments of each student admitted to a medical school.

3. *Honors.*—There is a chapter of an honorary medical fraternity at the University of Chicago to which 10 or 15 per cent of each senior class are elected. A group is first selected on the basis of scholarship, and from this high scholarship group the members are elected by the students. Membership in the honor fraternity, therefore, measures both scholarship and the student's personality as indicated by the ratings of his fellow students.

Other criteria of success in the medical school might be used, such as success in state medical board licensing examinations, the ability of a student to carry through to successful completion a piece of research, time required to complete the degree, or contributions to medical science. Some of these are difficult to measure and others require a longer time to study than was possible to give in this investigation. The three criteria chosen undoubtedly include, to a large extent, a number of factors than are common to other criteria that might be used. The solution to the problems raised in this study will, therefore, be sought in terms of (1) scholarship in the medical schools, (2) progress in the course, and (3) membership in the honor fraternity.

SOURCES OF DATA

In order to be able to compare the success of students who had two, three or more years of premedical education, it was necessary to collect data from classes which began when only two years of college work was required for admission to the Medical Schools; that is, from classes entering prior to 1922. Data for all classified students entering during the years 1918, 1919 and 1921 were collected. A few students are admitted to the Medical Schools each year as unclassified students. They do not seek a degree, but merely wish to take a few courses, for various reasons. These students were not included in the study. Also those entering the Rush Post Graduate School were omitted.

Students from other colleges or universities applying for admission to

our Medical Schools are required to submit with their applications, official records of all premedical work and medical work, if any, together with other pertinent information. If the student has his premedical work at the University of Chicago, the permanent records were consulted. Complete premedical records are thus available for comparison with complete medical records in the University of Chicago.

COLLECTION OF DATA

The study includes 294 cases. The following data, so far as they were obtainable, were collected for each student: (1) age at date the study of medicine was begun; (2) name, location, enrolment, and type of each college or university attended (both medical and premedical); (3) dates of attendance; (4) amount of work and average grade in the natural sciences, and in all subjects in each institution; (5) date of the last course taken in each science prior to entering the Medical School; (6) dates of receiving the four year certificate and of receiving the M.D. degree. (The latter date was usually a year to eighteen months later than the former on account of the required internship); (7) honors received; and (8) reason for withdrawing, if before graduation.

In presenting the results of this study I have chosen to bore you with a minimum of tables and proceed directly to interpretations and such conclusions as are suggested by the data. If any one is interested, I shall be glad to make available any part or all of the data.

We come now to the specific questions of our problem.

I. *Relation of Success in the Medical Schools to Age at the Time of Entering.*—For the solution of this aspect of the problem, the data were distributed in two ways. First, a simple age distribution showing for each age group the premedical average, the medical average, the honors won, the number graduating, the number withdrawing, and the number failing. The premedical average was given because it was the only measure obtainable indicating the intelligence of each age group. Second, the data were distributed so as to show the number of years over age or under age a student was at matriculation. In doing this, the normal age was taken as 18, plus one year for each year of college work completed. The reasonableness of the latter method of distribution is evident from the fact that some matriculants entered with two years of college work, some with three, some with four and some with even more.

The range in age of the group studied was from 18 to 48, with the median at 24½ years. The middle 50 per cent ranged from 23 to 27. The effect of age on the medical average was too small to be considered significant. Likewise, the differences in honors received, per cent graduated, and per cent failed are small, but are consistently in favor of the

middle age groups. There seems to be some evidence, though slight, that success in the study of medicine requires maturity. For the ages covered and for the groups represented, however, the effect of age is not sufficiently marked to warrant using age as a criterion in the selection of students.

II. *Relation of Scholarship in Premedical Courses to Success in the Medical Schools.*—Probably the most important single item to be considered in the selection of successful students in the Medical Schools is scholarship. It is the most commonly employed predictive measure in spite of the severe criticism it has received on account of the unreliability of teachers' marks. In this sudy it was attempted to show the relation between success in the Medical Schools and premedical scholarship in (1) the total premedical course, (2) the physical sciences, (3) the biological sciences, and, for the purposes of comparison, (4) subjects other than the natural sciences.

First, the coefficients of correlation were found between medical grades and each of these four variables using the total group of students. The highest correlation, 0.53, was between medical grades and the grades made in the total premedical program. A close second was a correlation of 0.50 between the medical grades and the grades made in the biological sciences. The lowest correlation, 0.38, was found for subjects other than the natural sciences. The physical sciences ranged between with a correlation of 0.46. With the exception of the correlation with subjects other than the natural sciences these are about as high as have been found in other studies of a similar nature. It is interesting to note that, so far as this group is concerned, the grades made in the biological sciences alone are almost as good for predicting success in the Medical Schools as are all grades taken together.

Because of the many factors of adjustment that are present when a student transfers from one institution to another, and because standards of grading vary greatly in different institutions, it was decided to find the same correlations for students who had both their premedical and medical work at the University of Chicago. Thus, many disturbing factors are eliminated. The correlations follow: Between the medical grades and (1) total premedical program 0.76; (2) the biological sciences 0.74; (3) the physical sciences 0.68, and (4) subjects other than the natural sciences 0.56. While the four subject groups rank about the same with respect to each other as when the total student group was considered, the correlations are significantly higher and of much more value for predictive purposes. They are about as high as are ever reached in relationships of this nature. We may conclude, therefore, that when scholarship in the medical schools is used as the criterion of success, grades made in pre-

medical work taken at the University of Chicago are much more highly predictive of success than grades made elsewhere. Furthermore, instructors' marks in the biological sciences, whether at the University of Chicago or elsewhere, are practically as good an index of success in medical work as are the marks in the total preparatory program.

Thirty-five of the 294 students of this study attained honors in the Medical Schools. A distribution of the premedical grade averages of these honor students in (1) all premedical subjects, (2) the biological sciences, (3) the physical sciences, and (4) subjects other than the natural sciences indicates that high scholarship in premedical education is closely associated with the attainment of honors in the Medical Schools. Furthermore, the average in the total premedical program is a slightly better index than is the average in the other three subject groups. Again, sixty of the 294 students averaged above four grade points, or B, in their preparatory work. Twenty-eight of the sixty made the honor fraternity as compared to seven of the remaining 234 who averaged below B. That is, 46.7 per cent of those who averaged B or higher in their premedical work attained honors as compared to 3 per cent who averaged below B.

The third criterion of success in the Medical Schools was called progress through school, graduation being the goal for all students admitted, failure being the farthest from success and withdrawal while in good standing being failure in the sense of not attaining the goal of graduation. On the basis of this criterion, it is again evident that scholarship in premedical work is predictive of success in the Medical Schools. On the other hand, it is surprising how many in the lower premedical scholarship levels graduate. The percentages graduating in the higher and lower levels does not show as great a difference as the difference in grades would indicate it might be. This merely reflects the fact that the Committee on Admissions to the Medical Schools has recognized other significant factors, as well as scholarship, in the selection of students.

Using this third criterion of success it was again found that the premedical average in all subjects was a better predictive measure than was the average in either the physical sciences, the biological sciences, or subjects other than the natural sciences. The difference in each group, however, was slight.

III. *Relation of Success in the Medical Schools to Type of Institution Previously Attended.*—Of the 294 students included in this study, 115 attended two or more institutions of different type in their preparatory work and one came from a foreign school. This leaves 178 students who attended one institution or, if more than one, they were of the same type. Very few of the 178 students attended more than one institution.

The median grades of these 178 students made in the Medical Schools was 3.41. Those coming from institutions approved by the Association of American Universities, 146 in number, made a median grade of 3.33; those from institutions accredited by regional associations but not by the Association of American Universities, 14 in number, made a median grade of 3.50; and those from institutions accredited by neither of the foregoing agencies, 18 in number, made a median of 4.18.

Using our second criterion, attainment of honors, we find that seven students, or 38.9 per cent, of those coming from non-accredited institutions made the honor fraternity as compared with 13.7 per cent from institutions approved by the Association of American Universities, and with no honors among the fourteen students coming from regionally accredited institutions. Our third criterion, progress through the course, showed no significant difference between the three groups.

While one cannot, legitimately, draw conclusions from the small number of cases here presented, the data do indicate that further study should be made. On the other hand, the difference in favor of the non-accredited institutions as shown by the first two criteria may be due to factors other than premedical training. In the selection of medical students the standing of the institution in which the applicant received his training is always taken into consideration. This is done by requiring those who come from non-accredited institutions to have outstanding records or recommendations, or both. They are scrutinized much more closely as to definite interests, personality, industry, and fitness for the medical profession. A fairer comparison, therefore, can be made only after equating those who come from non-accredited institutions with those who come from accredited ones. This was done on four bases: premedical scholarship, sex, amount of work completed, and age. The eighteen students chosen to match the eighteen from non-accredited institutions were all taken from the group of institutions approved by the Association of American Universities. Having 146 to choose from, it was possible to match the groups quite closely. The median medical grades made by these two equated groups were 3.51 for the A. A. U. group and 4.13 for the non-accredited group. Three of the eighteen from A. A. U. institutions attained honors as compared with seven from the non-accredited institutions. All eighteen A. A. U. students graduated as compared to sixteen graduates and two failures in the other group. It is clear that outstanding students from any school are better than the average students in approved schools.

IV. *The Relation of Success in the Medical Schools to Amount of Premedical Education.*—Since the first decade of this century there has been

a tendency to increase the amount of premedical education required before entering on the study of medicine. This, together with the lengthening of the medical course itself, has made a recognized medical education difficult to attain. At the University of Chicago, to secure the M.D. degree, one must spend three years in college, four years in the study of medicine, and one year as an intern—a total of eight years. In a few institutions the period is one year longer. The median age at which the students in this report began the study of medicine was 24.6 years, thus delaying the earliest date of graduation until the age of 29.6 years. It is fairly well agreed that at least two years of premedical training in college is necessary. The problem arises as to whether more than this is of sufficient value to justify additional cost in time and expense.

In order to get comparative data on this subject, it was necessary to draw from the classes entering prior to 1922 when only two years were required for admission. A distribution was made showing the amount of premedical training received by the 294 students of this study and the medians of the medical averages made by each group. The step intervals were made so as to include those who had approximately two years, three years, four years, five years, and over five years of training, respectively. The group with four years of training (from 32.0 to 40.9 majors) made the highest record, with the 3-year group nearly as good. The 2-year group did somewhat poorer than the 3-year group and the group having more than four years of premedical work did poorer than the 2-year group.

The success of the medical students with different amounts of premedical training, when judged on the basis of honors attained and progress through school, showed the students with four years of premedical training to be slightly better than the others.

An attempt was made to get a fairer comparison of the success in the Medical Schools of students who had two years, three years and four years of premedical training by equating the three groups on the bases of sex, premedical scholarship, and age. It was possible to get thirty men from each of the three groups who were practically equal in premedical scholarship and age.

Comparing these three groups, we find that as the amount of premedical education increases the scholarship rises. Although the differences between the 2-year, 3-year and 4-year groups are small, yet the fact that the groups were equated gives the results more significance than they otherwise would have.

According to the criterion, honors received, the 2-year and 4-year equated groups are equal, seven out of each group of thirty having been

successful. They were better than the three-year group, only three of whom received honors. All three groups were exactly equal so far as progress through school is concerned, every member of each group having graduated.

In general, medical students who have had four years of premedical training seem to be slightly superior to those with two or three years of preparatory training. However, the difference is small and the question remains as to whether the added value justifies the additional time and expense involved.

V. *Relation of Success in Medical Schools to Amount of Physical and Biological Sciences in Premedical Work.*—In view of the close relationship between the natural sciences and medicine, one would expect to find that the amount of physical and biological science taken in the pre-medical course would have a marked effect on scholarship in the Medical Schools. A distribution of the average medical grades made by students having varying amounts of work in the physical sciences shows that the average medical grade increases from 3.21 for the group having less than five majors to 3.46 for the group having more than eleven majors. The premedical average for the same group increases from 3.25 to 3.76, an even greater increase. These data, therefore, do not show that the physical sciences have any particular value in training students for a medical education. The same conclusion was reached when honors attained and progress through the course were used as criteria of success.

When the relation of amount of biological sciences to success in the Medical School was considered, there was a little evidence that a study of biological science contributes to success in the study of medicine.

It was noted from the data that the amount of work taken in either the physical or the biological sciences depends somewhat on the amount taken in the other. The student's premedical program being limited, he can take only a limited amount of work in the natural sciences so that often he has to omit desirable courses in either the physical or biological fields. For this reason it was decided to combine the amount of work in the two. When this is done, there is evidence that the amount of natural science in the premedical program bears a direct relation to success in the Medical Schools.

SUMMARY

1. Scholarship, progress toward a medical degree, and election to the honor fraternity were used as criteria in the evaluating of various possible factors relating to selective admission.
2. Age at the time of entering Medical School is not sufficiently

marked in its effect to warrant use as a criterion of selecting students.

3. Scholarship in premedical courses is a valuable predictive measure in selecting medical students.
4. Students with four years of premedical training are slightly superior to those with three or two years. It is open to question whether this slight difference justifies the expenditure of one or two years additional time.
5. In this group of students those coming from non-accredited institutions did better work than those coming from accredited institutions.
6. While there is some relation between the amount of work taken in the natural sciences and success in the Medical Schools, the relationship is not high.

Report of Committee on Educational Policies*

The Committee on Educational Policies, after consideration of a provisional report on Medical Education and the Reform of Medical Studies, which is being submitted to the Health Committee of the Health Organization of the League of Nations in Geneva this month, begs to recommend that this Association go on record as approving of the following principles regarding medical education:

1. That medical education should train the student in the cultivation of health, in the prevention of disease and in the practice of medicine, both individualistic and organized.

2. That the main purpose of undergraduate medical courses is to train "the basic doctor" by a basic medical curriculum; that is to say, the practitioner, capable of thinking for himself, endowed with initiative and resourcefulness, suited to the needs of modern society and the new forms of medical practice, and ready to be ripened by experience and life after he graduates.

3. That in the basic curriculum, consideration should be given to replacing the quantity of the subjects taught by the quality of the knowledge to be acquired, the overextensiveness by thoroughness. The tendency to turn out the doctor who is a walking encyclopedia of medical science should be avoided.

4. That scientific instruction and clinical experience, theoretical teaching and practical application, university laboratories and hospital services, academic freedom and apprenticeship under guidance should be made complementary to one another in the institution, the curriculum and the methods of instruction.

5. That it is essential that there should be a liaison and exchange between the preclinical scientific period and the clinical period of the course, the teaching of the fundamental sciences being continued into the clinical part of the course, and of the broad clinical principles being introduced in the preclinical period.

6. That the instruction in the preclinical sciences should be governed by the following principles:

(a) That, as the purpose of medicine is the promotion and cultivation of the health of people in addition to the treatment of sick patients, a thorough knowledge of the normal living, growing and functioning being is essential.

(b) The basic course in Anatomy should provide the student with a sound general knowledge of the structure of the normal human being in a state of health. Much of the detailed knowledge which is essential for special fields of practice but not for a basic course, should be omitted. A greater coordination with physiology and the functional activity of structures as well as with the clinical subjects should be introduced.

(c) The increasing importance of physiology as a fundamental subject of medical education, as an experimental science, as a key to clinical training, as a means towards improving early diagnosis and treatment, and as a knowledge of the body functions in the normal healthy man, should be realized.

7. That clinical instruction should remain as the center of gravity of the

*Presented at the executive session of the Forty-fourth Annual Meeting of the Association of American Medical Colleges held in Minneapolis, October 31, 1933.

whole medical course, where a synthesis of all theoretical, scientific and clinical principles should be effectively carried out.

8. That clinical instruction in each year should include the presentation of the subject where applicable from the standpoint of its relation to hygiene, to social service, to public health (including the care of indigents), to insurance (accident and life) and to industrial and community practice.

9. SPECIALIZATION:

(a) That the training of the "basic doctor" should include only the main fundamental principles of the specialties needed by the general practitioner.

(b) That the training for the specialties should be provided for by the organization of graduate courses of instruction.

(c) That the determination of the qualifications of specialists to practice in a special field should be based on the fulfillment of certain minimum educational requirements and the passing of a specialist examination.

(d) That the possession of the necessary qualifications be recognized by a noncompulsory certificate or diploma and by the publication of a register or list of those holding such specialist certificate.

(e) That the supervision of the qualification and certification of specialists be placed under a board or council, consisting of representatives of the medical practitioners, the medical associations, the medical licensing bodies and the universities.

(Signed)

E. S. RYERSON, Chairman.
ALAN M. CHESNEY
HAROLD RYPINS

Report of Committee on Foreign Medical Students*

In February, 1933, a meeting was called of representatives of the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges, the Federation of State Medical Boards of the United States, the National Board of Medical Examiners and the Board of Regents of the University of the State of New York, to consider the question of the licensure of graduates of European medical schools. Upon the recommendation of this committee the Federation of State Medical Boards of the United States adopted the following resolution:

1. No American student matriculating in a European medical school subsequent to the academic year 1932-1933 will be admitted to any state medical licensing examination or to the examination of the National Board of Medical Examiners, who does not, before beginning such medical study secure from a State Board of Medical Examiners or other competent state authority, a certificate endorsed by the Association of American Medical Colleges or the Council on Medical Education and Hospitals of the American Medical Association showing that he has met the premedical educational requirements prescribed by the aforementioned associations.

2. No student, either American or European, matriculating in a European medical school subsequent to the academic year 1932-1933 will be admitted to any state medical licensing examination, or the examination of the National Board of Medical Examiners, who does not

(a) Present satisfactory evidence of premedical education equivalent to the requirements of the Association of American Medical Colleges, and the Council on Medical Education and Hospitals of the American Medical Association, and graduation from a European medical school after a medical course of at least four academic years, and

(b) Obtain a license to practice medicine in the country in which the medical school from which he is graduated is located.

The presiding officer, Dr. Ray Lyman Wilbur, President of the Council on Medical Education and Hospitals, appointed a committee to confer with representatives of the various European countries in reference to the licensure of European graduates throughout the United States. The committee has the honor to report as follows:

The problem of the licensure of European trained students falls naturally into two parts: (1) the licensure of native-born European graduates and (2) the licensure of American students graduating in Europe.

NATIVE-BORN EUROPEANS:

In the absence of a definite classification of European medical schools it has been the custom in most states to admit to the examination graduates of established European universities. During the five-year period 1927-1931 there were 1,157 such native European graduates examined throughout the United States, of whom 50 per cent failed, as contrasted to only 4.5 per cent failures among American trained graduates. However, the following figures for New York State, which include over three-fourths of all the foreign trained candidates, show that there is a gradual falling off in the number of these applicants.

FOREIGN CANDIDATES

New York Medical Licensing Examination

	No. candidates	No. failed
1929	195	96
1930	173	107
1931	186	88

*Presented at the executive session of the Forty-fourth Annual Meeting of the Association of American Medical Colleges held in Minneapolis, October 31, 1933.

1932	176	91
1933	167	78
Total	897	460
Percent failed		52.4%

This falling-off is probably due to the operation of the immigration quotas.

In view of the fact that American medicine has been broadened and enlarged by the presence of well trained European practitioners; that the total number of native European graduates is annually diminishing to a small group which can easily be assimilated; and that the state licensing examinations appear to be operating as an effective barrier against the licensure of the less qualified half of these applicants, it is recommended that at the present time no action is indicated in reference to this native-born European group.

Owing to the racial and religious persecution of the Hitler regime in Germany there has naturally arisen during the past year an increase in the number of German physicians desiring admission to licensure in the United States. There are no figures available for the number of these practitioners, but less than twenty have applied in New York state during the past year and probably not more than a dozen have been admitted. The number of these refugees will be limited by the immigration quota. In view of the limited number of these applicants, the consistent American policy of assisting political refugees and the high standing of many of these unfortunate physicians, there is no warrant for any alarm as to the possible overcrowding of American medicine by this group. It is therefore recommended that subject to the usual educational and licensure tests they be assisted to reestablish themselves in this country as physicians.

American Graduates of European Medical Schools.

According to the report of the Council on Medical Education and Hospitals of the American Medical Association of August 26, 1933, the number of American students studying medicine in Europe for the past three years is as follows:

1930-1931	977
1931-1932	1483
1932-1933	1911

Figures for the present academic year are not yet available but it is believed that owing to this committee's activities the number for the current year will be definitely decreased.

During the past year your committee has had the privilege of friendly conferences with medical and governmental representatives of several of the European countries. It is apparent that the acceptance of this large number of American students in Europe was in large part due to the failure of the European authorities to realize the average quality of this group of applicants and the attitude of the medical authorities in this country in reference to this group. The action taken last year in reference to this problem immediately precipitated a clearer understanding of this problem. The present status of American students in European countries is as follows:

Great Britain

Due to the fact that in Great Britain alone of all the European countries there is no citizenship qualifications for licensure, England, Scotland, Wales and Ireland were the only European countries licensing American students and thus automatically meeting the requirements of our joint announcement. In view of this fact no

attempt has been made to take up this problem with the British authorities. Many of the British schools have discovered for themselves that not all of the American applicants are desirable ones and have voluntarily restricted the number admitted.

In 1932-1933 there were 57 American students in England, 19 in Ireland and 376 in Scotland. Of the latter 143 were in the School of Medicine of the Royal Colleges of Edinburgh and 55 in the Anderson Medical College of Glasgow, both so-called extramural schools. There were 79 in the University of St. Andrews.

While there is no doubt that American students are given equal opportunities with native students in British schools, it is highly probable that by and large the group of Americans who have been admitted to these British schools is not comparable either to the group of students admitted to American schools or to the native British students. A better selection of this group would serve to raise the reputation of American students in Great Britain and the reputation of British medical schools in the United States.

The voluntary plan of selection in this country now successfully employed in reference to the admission of American students to Italian medical schools would be of definite service in the selection of students for admission to British medical schools. It is recommended that the committee undertake to make such an agreement with the proper British medical authorities.

Italy

During the year 1932-1933 there were 222 American students enrolled in Italian medical faculties, many of whom had either been refused admission to recognized American schools or had been unsuccessful in their medical education in this country.

Following the joint announcement that in addition to meeting the preliminary and professional requirements American students studying in Europe would be required to obtain a license in the country in which they study, the Italian government delegated Dr. Robert Alessandri, Professor of Surgery in the University of Rome, to take up this matter with your committee. The Italian authorities fully understand our attitude in reference to this problem and have made the following agreement:

1. No student shall be admitted to an Italian medical faculty who has not completed the preliminary general education required for admission to an American medical school, namely, the satisfactory completion of a two-year course of study in a registered college of liberal arts and science, or its equivalent, and who has not obtained the medical student qualifying certificate.
2. Students who are admitted shall pursue a course of study in an Italian medical faculty of at least four years.
3. After obtaining the degree of doctor of medicine students shall also pass the State Board examination in Italy.
4. Students who are in good standing in an approved American medical school shall be admitted to an Italian medical faculty in the corresponding year of study, so that the student will graduate in the same year as if he had continued his studies in America.
5. No student shall be admitted to an Italian medical faculty who cannot continue his studies in an American medical school on account of unsatisfactory school record.

In order to make a selection of American students who propose to study medicine in Italy, the Italian Universities have empowered the Italian Consulate General of New York City to examine all documents and official transcripts of school and college records.

In making this selection the Italian Consulate General will be guided by the same standards that prevail in the admittance of students to American medical

schools, and will seek in each individual case the advice of a competent medical authority who for the present is Professor William C. MacTavish of New York University.

In the case of students who have been admitted to the first year of an approved American medical school or of students who are more advanced in their medical studies and in good standing, and who later decide to transfer to an Italian medical faculty, the Italian Consulate General of New York shall not seek the advice of the competent medical authority referred to above; since the presentation of evidence of their admission to or their being in good standing in an American medical school is sufficient for their admission to an Italian medical faculty.

In the month of December of each year the Italian Consulate General of New York shall communicate to the Federation of State Medical Boards of the United States, or to the individual board of each State and to the Council on Medical Education of the American Medical Association, the complete list of American students who have been selected to study medicine in Italy.

These requirements and regulations do not apply to American students who registered in an Italian or European university prior to March 1, 1933.

Your committee has been very fortunate in securing the assistance of Professor William C. MacTavish who is in charge of the premedical students at New York University and whose wide knowledge of American undergraduate colleges and American medical education is universally recognized. Professor MacTavish has submitted the following data in reference to the selection of 16 candidates out of 62 applicants for admission to Italian medical schools:

Total number of applicants	62
Refused	42
Granted	16
Pending	3
Advised to study Italian before matriculating	1
Reasons for refusals:	
Poor scholarship	21
Failed first year at American medical school	12
Low aptitude percentile rating	3
Science average too low	5

This voluntary restriction in the selection of students for Italian medical schools goes far beyond the requirements of our joint action and indicates the value of friendly conferences and mutual understanding in the solution of this international problem. It is suggested that in so far as possible the procedure now in operation in reference to American students entering Italian medical schools serve as a model for future agreements with the other European authorities.

France

Following vigorous expressions of resentment on the part of the French Ambassador, the French government authorized Dr. Edouard Rist to meet with your committee. As a result of two very friendly conferences, the last of which was participated in by members of the Board of Regents of the University of the State of New York and the Institute of International Education, Dr. Rist expressed a full appreciation of the attitude of the American authorities. He states, however, that under no conditions would American students be permitted to obtain the state medical degree, which is the license to practice medicine in France, but would be limited to the academic university degree only, which is simply an academic distinction. Dr. Rist stated that this position would mean the practical elimination of the study of medicine by Americans in France, but that at the present time there

was no desire on the part of his government to modify this position. At the present time, therefore, American students studying medicine in France will not be eligible for licensure throughout the United States.

Belgium

There have been no conferences with the Belgian authorities but correspondence indicates that their position is practically the same as that of the French authorities and that at the present time American students in Belgium cannot meet the requirements for admission to American medical licensing examinations.

Germany

Early in the year a representative of the German Ministry of Education was in this country to take up among other things the status of American students in German medical schools, of whom during the year 1932-1933 there were 337. This representative failed to keep his engagement to discuss this matter with the Chairman of your Committee and sailed the following day for home. Consequently, at the present time there is no agreement with the German government and students have been advised that at the present time they will not upon the completion of their medical studies in Germany be admitted to American medical licensing examinations.

In view of the fact that German citizenship is required for the license to practice medicine in Germany it is probable that no satisfactory arrangement can be made.

Owing to the racial and religious persecution of the present German government a large number of American students have transferred from German universities to those in other European countries, particularly Scotland, Switzerland and Italy. In view of the fact that our joint agreement was not meant to be retroactive these students have been advised that if they began their medical studies in German medical schools prior to March 1, 1933, they will upon the completion of their medical studies in another European medical school be eligible for admission to American medical licensing examinations, provided they meet the usual educational requirements.

Austria

Through the solicitation of the Hamburg-American Line the authorities of the University of Vienna have expressed the opinion that American students receive the same training as native students but that they cannot receive a license to practice medicine in Austria unless they become Austrian citizens. The joint announcement has been placed in the hands of the Austrian Consul General who is taking up the matter with the Austrian authorities and will presumably communicate with your committee. In the meantime both he and the Dean of the University of Vienna have been asked to advise American students that at the present time they will not upon the completion of their studies be eligible for admission to American medical licensing examinations.

Hungary

The joint announcement has been placed in the hands of the Consul General of Hungary who has communicated its contents to the proper authorities and states that he will take the matter up with your committee when he has authentic information in reference to the status of American students in Hungary.

Switzerland

There were 403 American students in Switzerland last year and this number

has doubtless been augmented by the transference of many former students in German medical faculties to Switzerland. The Swiss authorities state that at the present time their citizenship law makes it impossible for American students to be admitted to the Swiss licensing examination but that they have under serious consideration the possibility of amending their statute to permit American students to obtain a license to practice medicine in Switzerland.

Czechoslovakia

The Consul General of Czechoslovakia has expressed the desire that a limited number of well-selected students be permitted to study in the Czechoslovakian medical faculties. A copy of the joint announcement has been submitted through him to the Czechoslovakian government and at the present time no definite information in reference to the status of American students in this country is forthcoming.

Other European Countries

No communications or conferences have been had with the governments of Spain, Portugal, Russia, Norway, Sweden, Holland, Poland or Greece, and with rare exception there are practically no American students studying medicine in these countries.

Proposed Method of Selection

The object of our associations has been to ascertain that American students studying in Europe shall not be admitted to practice in the United States unless (1) they have a preliminary educational record which would admit them to a recognized American school; and (2) that they receive in Europe a professional education not inferior to that required in this country nor in any degree less rigorous than that required of native students for admission to practice in the native country. These objects should be clearly borne in mind by the committee in determining its future activities.

The Secretary of the Association of American Medical Colleges has very generously passed upon a large number of academic credentials of these applicants but has of necessity been limited to the statement that these applicants do or do not possess the minimum technical requirements for admission to an American medical school. Since over 90 per cent of these applicants possess such minimum technical requirements this probably has accomplished little in restriction and selection and owing to the relative ignorance of the European authorities of our manner of selecting medical students has in many cases led to regrettable misunderstandings. It is recommended that in the future this form of evaluating credentials be discontinued and that a committee be appointed to advise the various European authorities whether or not a student possesses an academic record comparable to that actually required for admission to a recognized American medical school. The very satisfactory result of Professor MacTavish's voluntary evaluation of credentials for the Italian Consul General illustrates the advantages of this procedure.

In this connection Professor MacTavish states that certain deans of American medical schools have issued ambiguous statements in reference to the academic records of certain of these applicants. While these deans have refused to admit these applicants to their own schools they have stated that their records make them eligible for admission, which has been misinterpreted as meaning that these students are acceptable for admission to a recognized American medical school.

It is recommended that the deans of the medical schools be advised to distinguish clearly between stating that an applicant possesses the minimum technical requirements for admission to an American medical school and that the applicant is eligible for admission to such a school.

SUMMARY

1. The number of native born Europeans applying for admission to the medical licensing examinations is annually diminishing and the examinations appear to be serving as a barrier against the licensure of the incompetent.

2. At the present time the only European countries in which American medical students matriculating after March 1, 1933, will upon the completion of their studies be eligible for admission to American medical licensing examinations are Italy and the British Isles.

3. There has been established a voluntary method for selecting and restricting American students for admission to the study of medicine in Italy, which is eminently satisfactory and should serve as a model for agreements with other European countries.

4. The joint action of the Federation of Medical Boards of the United States, the Council on Medical Education and Hospitals of the American Medical Association, the Association of American Medical Colleges and the National Board of Medical Examiners has definitely decreased the number and improved the quality of American students studying medicine in Europe. It has undoubtedly raised the prestige of American medicine in Europe and will raise the reputation of European medical faculties throughout the United States and result in a mutual understanding between the medical profession in this country and in Europe.

RECOMMENDATION

It is recommended:

(1) That no action be taken in reference to the admission of native born Europeans for admission to American medical licensing examinations and that in so far as is consistent with the maintenance of high educational and professional standards physicians who are the victims of racial and religious persecution in Germany be permitted the privilege of practicing medicine in the United States;

(2) That the voluntary method of selecting in this country students for admission to Italian medical schools serve as a model for similar agreements with other European countries and that a committee be appointed to advise and assist European authorities in reference to the selection of American students; and

(3) That your committee be continued with authority to carry on further negotiations with the various European authorities looking toward a proper selection and restriction of American students in Europe.

Your committee desires to express its appreciation of the valuable cooperation of Professor William C. MacTavish of New York University and of the sympathetic understanding of this problem by the representatives of the various European countries.

Respectfully submitted,

HAROLD RYPINS, Chairman
J. STEWART RODMAN
W. L. BIERRING
WM. D. CUTTER
FRED C. ZAPFFE

JOURNAL
OF THE
Association *of* American Medical Colleges

Volume 8 NOVEMBER, 1933 Number 6

The Forty-fourth Annual Meeting

This meeting was held in Rochester and Minneapolis, October 30 and 31, and November 1. The University of Minnesota and the Mayo Foundation were the hosts.

The local arrangements in both cities were excellent and met with unanimous approval of everyone in attendance on the meeting. The weather was ideal.

Sixty-five of the institutions in membership in the Association were represented by one or more delegates. Many members of the faculty of the Mayo Foundation and of the staff of the Mayo Clinic also attended the session of the first day.

The dinner on Monday evening was unusually well attended. Dr. Louis B. Wilson, president of the Association, presided as toastmaster. Dr. William J. Mayo, too well known to be designated specially, Mr. Guy Stanton Ford, dean of the Graduate School of the University of Minnesota, and Mr. Lotus D. Coffman, president of the University, delivered addresses which aroused much enthusiasm and unanimous approval.

The program was well received. Everyone listed to read a paper or participate in a discussion was present to do his part—and did it well.

Much important business was transacted. It will be reported on specifically in the minutes of the meeting.

The following officers were elected for the ensuing year: President: Ross V. Patterson, Jefferson Medical College; vice president: C. W. M. Poynter, University of Nebraska, secretary; Fred C. Zapffe, Chicago; treasurer: B. C. H. Harvey, University of Chicago. W. C. Rappleye, Columbia University, and W. S. Leathers, Vanderbilt University, were elected to membership on the Executive Council.

Nashville, Tennessee, was selected as the next place of meeting. Time: October 29, 30 and 31, 1934.

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Fraudulent Credentials

Harold Ramsey Allison, of Houston, Texas, applied for admission to Tulane University of Louisiana School of Medicine, attempting to gain admission through a misleading statement of his own to the effect that he had "not" attended any other medical school, whereas he did attend the Medical School of the University of Texas in 1932-1933, and was "dropped because of irregularities during examinations, without privilege of return."

Neither of the two letters of recommendation from physicians presented in Mr. Allison's behalf, indicated that he had been at another medical school, with an unsatisfactory record.

Mr. Allison was accepted with the provision that, since his premedical credits showed a lapse of one year since completion, he should send a statement from someone who knew him well enough to certify that he had not attended any medical school during the session 1932-1933, or since his graduation from Rice Institute in 1932. Then it was discovered that Mr. Allison had attended the University of Texas Medical School in 1932-1933.

◆ ◆

James Joseph Visconti, 711 Garden St., Hoboken, N. J., was admitted as a Freshman student to the University of Cincinnati College of Medicine, Septem-

ber 21, 1931. He completed his first year with a satisfactory record and was advanced to the sophomore year. In the first semester of the sophomore year he was conditioned in bacteriology and had a failure in pathology. At the conclusion of the semester he was called to the dean's office and warned concerning his poor scholarship. At the conclusion of the second semester he had another failure in preventive medicine, low grades in the courses in pharmacology and neuro-anatomy. As the result of these three deficiencies on his record and the general deterioration in scholarship, he was dropped from the rolls of the college and so advised June 7, 1933.

September 11, he wired the college that he had completed courses in pathology and preventive medicine at Harvard and Michigan Medical Schools, respectively, and inquired as to whether he would be eligible for the junior class. He was advised that his career at the college had been terminated and that there was no possibility of his return. He then wired for a transcript of his record. This was prepared and sent to him on either September 12 or 13.

September 26, a letter was received from Professor W. C. MacTavish of the New York University, stating that he was acting as an advisor to the Royal Italian Consul and asked to know something about the standing of James Joseph Visconti and whether or not he would be eligible to continue the study of medicine at the University of Cincinnati. A copy of his record was sent to Professor MacTavish. October 9, Mr. MacTavish returned the transcript sent him on October 4, and one which he states Mr. Visconti presented to the Italian Consul and which was dated September 19. The latter record is a fraudulent one. The signature of the dean's secretary has been forged, the impression seal of the University has also been forged, and while the same grade of safety paper has been used, the type used on the form is smaller and definitely different, and the record inserted for the sophomore subjects in three instances where failure and conditions were recorded are entirely erroneous.

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The credentials of Mr. Edward Thomas Kennedy, who was a student in the College of Medicine of the University of Illinois for one semester during the year 1929-1930 were forgeries. He was admitted to the College of Medicine on the basis of credentials from the Loyola University which Mr. B. J. Steggert, registrar of that institution, asserts were forged. This came to light recently when Mr. Kennedy submitted a second forged credential from the same institution in petitioning for readmission. He was originally dropped by Illinois for unsatisfactory scholarship.

✦ ✦

Chinese Medical Students Offer Sacrifices

Each year, in April, the medical students of the Peiping National University make a pilgrimage to the cemetery in which are interred patients who were treated in the University Hospital free of charge and offer sacrifices to the spirits of those whose bodies were examined by the department of pathology of the University after their death. In most cases consent for an autopsy had been obtained from the patient.

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The First License to Practice Medicine

Priority in anything, or the first time anything was done, has always been the subject of much debate and often acrimonious discussion. In the matter of licensure to practice medicine, much has been said about who was first.

Dr. W. S. Sherman, of Newport, Rhode Island, has found in his historical researches that one of the earliest laws

relating to medicine or surgery was passed in Newport September 17, 1641. It read as follows: .

"It is ordered that Mr. Robert Jeoffreys shall be authorized to exercise the function of Chirurgerie."

One of the first acts under the Royal Charter is of more than passing interest as it is believed to be the first medical degree conferred in any of the colonies, March 1, 1664, in Newport:

"Whereas the Court have taken notice of the great blessing of God on the good endevers of Captayne John Cranston of Newport, both in phissicke and chirurgery, to the great comfort of such as have had occation to improve his skill and practice, &c. The Court doe therfore unanimously enacte and declare that the said Captayne John Cranston is lycenced and commistioned to adminester phissicke, and practice chirurgery throughout this whole Collony, and is by this Court styled and recorded Doctor of phissicke and chirurgery, by the athority of the Generall Assembly of this Collony."

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Teaching Methods in Medicine

It is a well known fact that until now nothing by way of a text on teaching medical subjects has been available. This is no longer the case. Dr. William D. Reid, assistant professor of cardiology in the Boston University School of Medicine, has published a book on Teaching Methods in Medicine in which he applies the philosophy of contemporary education to medical schools.

The book must be read to be appreciated and appreciated it will be because it is full of much of value to every teacher in the medical school. It gives the answer to many problems which beset teachers, the writer having made a thorough study of methods of teaching in a school of education with a view to attempting to apply them to medical teaching. He has been a medical teacher for a long time and has been deeply interested in teaching from the standpoint of making it more effective. Here he presents his views as to how this can be accomplished. It is gratifying to know that some one has had the courage to tackle so fearsome a subject.

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What Price Uniformity?

The Federation of State Medical Boards of the United States was organized twenty years ago for the purpose, primarily, of bringing about a greater uniformity in the regulations governing the practice of medicine. Without legislative authority, the Federation has been influential in molding legislation. Without disciplinary power, it has yet stimulated and guided its membership so as to bring order out of what was formerly chaos. A notable step in the direction of establishing a uniformly high standard of professional training was taken at the meeting in February, 1930, when the following paragraph was added to the constitution:

"In all matters of premedical education, courses of study and educational requirements for the degree of Doctor of Medicine or its equivalent, the Federation recognizes the Association of American Medical Colleges as the standardizing agency for this purpose."

The *Federation* Bulletin, (Nov.) 1933, states that it would seem reasonable to expect that all the state medical boards would adjust their procedure so as to conform to the above declared policy. It is to be hoped, therefore, that no state will officially recognize a new school before it has received the approval of the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association. Such independent and precipitate action defeats the very ends for which the Federation was formed.

College News

University of Toronto Faculty of Medicine

Professor G. F. Marrian has been appointed associate professor in the department of biochemistry. He is a Doctor of Science of the University of London, London, England, and a Fellow of the Institute of Chemistry. He began as a demonstrator in the department of physiology and biochemistry at the University of London and finally became a lecturer. His awards are as follows: Beit Memorial Fellowship for Medical Research; The Mendola Medal, awarded by the Institute of Chemistry of Great Britain and Ireland; William Julius Mickle Fellowship awarded by the University of London.

Professor F. N. G. Starr and Professor K. C. McIlwraith have retired from the faculty of medicine and the title of professor emeritus has been given them.

The registration in medicine for the session 1933-1934 is 824, as follows: first year, 138; second year, 156; third year, 146; fourth year, 139; fifth year, 113; sixth year, 107; diploma in public health, 13; bachelor of science (medicine), 6; diploma in radiology, 1; postgraduate students, 5.

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Duke University School of Medicine

Oct. 2, 1933, the autumn quarter of the School of Medicine commenced, with 61 students enrolled in the first year class, 43 in the second year, 49 in the junior and 17 in the senior class, making a total of 170 students in the school.

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University of Alabama School of Medicine

Faculty promotions: Emmett B. Carmichael, Ph. D., head of the department of physiologic chemistry, to full professor; Dr. Franklin S. DuBois to professor of anatomy and head of the department; James O. Foley, Ph. D., to associate professor of neuro-anatomy; Thomas E. Hunt, Ph. D., to associate professor of histology and embryology; Dr. Gene H. Kistler to associate professor of physiology and pharmacology; Marie C. D'Amour, Ph. D., to assistant professor of physiology and pharmacology.

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Tufts College Medical School

Faculty changes: Dr. Benjamin Spector has been promoted to the head of the department of anatomy; Dr. Attilio Canzanelli, assistant professor of physiology; Dr. Max Ritvo, assistant professor in radiology; Dr. Harold A. Chamberlin, professor of urology.

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University of North Carolina School of Medicine

Dr. I. H. Manning has resigned as dean after twenty-eight years of continuous service. He will continue as professor of physiology.

Dr. Charles S. Mangum, professor of anatomy, succeeds Dr. Manning in the deanship.

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University of North Dakota School of Medicine

Faculty appointments: Dr. Harry D. Benwell has been appointed special lecturer in physical diagnosis and Dr. Donald B. Simonson, instructor in physiology and pathology.

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Woman's Medical College of Pennsylvania

Faculty appointments: Dr. Helen K. Grace has been appointed assistant in clinical gynecology and bacteriology, and Dr. Regina M. Dowie, assistant in clinical gastro-enterology.

Jefferson Medical College

The one hundred and ninth annual session was inaugurated Sept. 20, 1933, at 8 p. m.

Mr. Alba B. Johnson, president of the board of trustees, presided. The introductory lecture was delivered by Dr. J. Clarence Keeler, professor of otology, on "Hearing with Other People's Ears."

Dr. Ross V. Patterson, dean, welcomed the 573 members of the student body. The new students consisted of 160 freshmen and 4 juniors.

The members of the first-year class were prepared for medical study in 65 different institutions and all have received collegiate degrees. There were 650 applicants for admission to the first-year class who submitted formal certificates of preliminary education. Approximately 310 applicants with college degrees were declined admission.

Among the members of the class are sons of 14 Jefferson graduates, together with 5 other relatives of Jefferson graduates. There are five other sons of physicians, not graduates of Jefferson Medical College.

Geographically, 16 different states and insular possessions are represented, as follows: Maine, New Hampshire, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Delaware, West Virginia, District of Columbia, Ohio, Michigan, North Carolina, Oregon, California, Hawaii.

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University of Georgia Medical Department

Dr. Ferdinand C. Lee, of Johns Hopkins University, is visiting professor of surgery for the 1933-1934 session.

Dr. M. S. Dooley, professor of pharmacology in Syracuse University, is visiting professor of pharmacology. He is assisted by Doctor Wesson, associate professor of pharmacology in Vanderbilt University.

Dr. J. O. Pinkston, an associate of Dr. Cannon, of Harvard University, is giving the course in physiology.

Dr. W. H. Kelley has been appointed director of the outpatient department.

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University of Virginia Department of Medicine

A gift of $75,000 has been received to defray the cost of the study and treatment of mental diseases, and $100,000 for the study of cancer.

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Yale University School of Medicine

Harold Saxton Burr, Ph. D., professor of anatomy, has been appointed E. K. Hunt professor of anatomy and head of the section of neuroanatomy. He succeeds Dr. Harry B. Ferris, retired in this position. Dr. Edgar Allen succeeds Dr. Ferris as professor of anatomy and head of the department. Dr. Harry Zimmerman was promoted to associate professor of anatomy.

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Creighton University School of Medicine

Dr. Bryan M. Riley, professor and head of the department of medicine, succeeds the late Dr. Schulte as dean. Dr. Adolph Sachs, professor of medicine, succeeds Dr. Riley as head of the department. Dr. Riley and Dr. Sachs are Creighton graduates and have been members of the faculty for more than twenty-five years.

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University of Colorado School of Medicine

The school for nurses was closed in June for reasons of economy. It was established in 1898; suspended in June, 1922; resumed operation in 1924. Students now in training will complete their courses.

Dr. George S. Johnson, assistant director of the Psychopathic Hospital, has been appointed professor of neuropsychiatry in Stanford University School of

Medicine. He will be succeeded by Dr. Chas. A. Rymer, the resident psychiatrist in the hospital.

Dr. Franklin G. Ebaugh, director of the psychopathic hospital, will serve part of next year as director of the division of psychiatric education of the National Committee for Mental Hygiene.

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New York Post-Graduate Medical School

New courses in roentgenology and radiation therapy will be given during the coming academic year. The courses have been graded so that physicians may undertake from three to nine months of intensive progressive work. The first three months will be devoted to basic work, the second to clinical experience and the last to radiation therapy.

Application is limited to graduate physicians in good standing either with internship in an approved hospital or with five years' active general practice with hospital and clinic experience. The maximum number of applicants accepted will be eight. Fees for the three divisions will be $250 each, or $700 for the nine months.

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University of California Medical School

Dr. Guy L. Hunner, clinical professor of gynecology at Johns Hopkins University School of Medicine, conducted a clinic at the University of California Medical School August 17, 1933.

Dr. John Ruhrah of Baltimore, Maryland, addressed the faculty and students September 13, 1933, on "The History of Poliomyelitis."

Dr. Charles Weiss, lecturer in pediatrics at the medical school, is to give a series of twelve lectures during the winter of 1933-1934 on "Recent Advances in Bacteriology and Immunology."

The semi-annual alumni day will be held in San Francisco, November 24. A fine program has been prepared.

Northwestern University Medical School

A gift in excess of $300,000 has been received from an anonymous donor to be used for the advancement and improvement of the teaching of urology.

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College of Medical Evangelists

Drs. C. C. Browning, W. A. George, and Albert Hill, who have been professors in their respective departments of tuberculosis, surgery, and pediatrics for many years, have been made emeritus professors in their departments.

Dr. John V. Barrow, who has long been connected with this school as professor of clinical medicine, was made director of clinical teaching in the department of medicine at the Los Angeles County General Hospital. Dr. William H. Olds has joined the faculty as professor of clinical surgery and has been made director of clinical teaching in the department at the L.A.C.G.H.

Dr. Arthur B. Cecil has joined the faculty as professor of, and head of the department of urology. Dr. Carl R. Howson has been promoted to professor and made head of the department of tuberculosis. Dr. Cyril B. Courville has been made professor of and head of the department of neurology. Dr. W. A. Boyce, for many years professor of ophthalmology, is now head of that department. Dr. E. E. Moody has joined the faculty as professor of and head of the department of pediatrics. Dr. W. L. Halverson has been made head of the department of communicable diseases, with the rank of associate professor. Dr. Malcolm Hill has been made head of the department of proctology with the rank of associate professor.

Other appointments: Dr. C. B. Walker was made professor of clinical ophthalmology; Dr. H. J. Hara and Dr. O. H. Homme, professors of clinical otolaryngology; Dr. B. E. Grant and Dr. J. A. Pollia, associate professors of medicine;

Dr. T. I. Zirkle, associate professor of bacteriology; Dr. T. S. Kimball, assistant professor of pathology; Dr. Floyd Lee, assistant professor of gynecology; Dr. W. A. Morrison, assistant professor of surgery.

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Temple University
School of Medicine

The opening exercises were held September 27, Dean William N. Parkinson presenting the members of the teaching staff to the incoming students.

The enrollment for the session 1933-1934 is as follows: First year, 113; second year, 117; third year, 109; fourth year, 120.

The total of 459 includes 127 new students, 110 admitted to the first, 2 to the second and 15 to the third year class. These students completed their premedical courses in 33 institutions and the following states were represented: California, Florida, Illinois, Maryland, Michigan, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, also Hawaii and Puerto Rico. There are 95 Pennsylvanians and 17 sons of physicians.

The freshman class was selected from a total of 978 applicants who submitted formal applications and credentials. Inquiries were received from approximately 1,900 students.

Teaching facilities were further enhanced by the addition of a clinical amphitheatre, the gift of Mr. Charles G. Erny, a member of the Board of Trustees of Temple University.

President Charles E. Beury announced the appointment of Dean Parkinson to the Board of Trustees.

Dr. Walter I. Lillie has been appointed professor of ophthalmology at Temple University. Dr. Lillie is a graduate of the University of Michigan and the graduate school of the University of Minnesota.

Dr. W. Wayne Babcock, professor of surgery, was unanimously elected president of the American Association of Obstetrics, Gynecology and Abdominal Surgeons, at the 46th annual meeting held in Quebec, Canada.

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St. Louis University
School of Medicine

Faculty changes: Dr. Wm. H. Vogt, associate professor of gynecology and obstetrics, has been made professor and director of the department. Drs. Edgar F. Schmitz and Edward Lee Dorsett have been appointed associate professor of gynecology and obstetrics and assistant professor of gynecology, respectively. Dr. Solomon A. Weintraub has been promoted to assistant professor in this department. Dr. Leland B. Alford has been promoted to the rank of associate professor of neurology and psychiatry.

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New York Homeopathic
Medical College

A course of ten lectures, one lecture weekly, on cultural medicine has been announced. Some of the lecturers and their subjects are: Drs. George G. Ornstein, on the history of tuberculosis; William Francis Honan, evolution of modern surgery; William H. Dieffenbach, economics of medicine, and Walter Gray Crump, the art as compared with the science of medicine.

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Johns Hopkins University
School of Medicine

Dr. Arturo Castiglioni, professor of the history of medicine, University of Padua, Italy, gave the third course of lectures October 23, 25 and 27, under the Hideyo Noguchi Lectureship. The theme of the lectures was "The Renaissance of Medicine in Italy." The individual titles of the lectures were: "The Dawn of Renaissance in the Life, Art and Science of Italy—The Thought of Leonardo"; "The Flowering of Medical Studies at the Italian Universities, from Berengario to Cesalpino"; "The Legacy of Scientific Renaissance and the Main Currents of Medical Thought from Fracastoro to Galileo".

Personals

Dr. Ernest E. Irons, dean of Rush Medical College, has been appointed chairman of the department of medicine in the University of Chicago.

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Dr. W. C. Potter, formerly assistant professor of physiology in the University of Georgia Medical Department, has joined the faculty of the University of Mississippi School of Medicine and will have charge of the course in physiology for the coming year.

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Dr. Francis G. Blake, professor of medicine in Yale University, has been appointed chairman of the division of medical sciences of the National Research Council for the ensuing year.

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Dr. Milton J. Rosenau, Wilder professor of preventive medicine and hygiene, Harvard Medical School, was awarded the William T. Sedgwick Memorial Medal by the American Public Health Association, for distinguished service in public health.

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Prof. George Barger of Edinburgh gave the first lecture of the Smith-Reed-Russell series at George Washington University School of Medicine, October 3. He spoke on "Ergot and Ergotism."

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Dr. Nathan Chandler Foot resigned as professor of pathology in the University of Cincinnati College of Medicine to go to Cornell University Medical College.

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Dr. George S. Jolison, professor of psychiatry in the school of medicine of the University of Colorado, has accepted the appointment as professor of neuropsychiatry at Stanford University Medical School.

Dr. F. G. Novy, professor of bacteriology in the University of Michigan, has been appointed dean of the medical school. The duties of a dean have, for a number of years, been discharged by a committee of the faculty of which Dr. Novy was chairman.

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Dr. Bernard F. McGrath, former dean of Marquette University School of Medicine, who resigned from this position a few months ago, was found dead in bed in his room in the New York Athletic Club. Heart disease was the cause of death.

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Dr. George H. Hansmann, formerly assistant professor of pathology in State University of Iowa College of Medicine, has joined the faculty of Georgetown University School of Medicine as associate professor of pathology.

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Arthur M. Lassek, Ph. D., a member of the department of anatomy in the University of South Dakota, has been appointed professor of anatomy in the Medical College of South Carolina.

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Dr. Eben J. Carey, dean and professor of anatomy, Marquette University School of Medicine, was awarded a gold medal by the Radiological Society of America in recognition of his roentgenologic study of bone growth.

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Dr. Otto Louis Mohr, professor of medicine, Royal Frederiks University, Oslo, Norway, will deliver three lectures under the Edward K. Dunham Lectureship for the Promotion of the Medical Sciences on "Genetics and Pathology," at Harvard Medical School.

Dr. George R. Minot, professor of medicine, Harvard University Medical School, Boston, has been awarded the Moxon gold medal of the Royal College of Physicians of England.

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Dr. Luther L. Hill, Montgomery, former president of the Medical Association of the State of Alabama, gave the annual address commemorating the 79th Anniversary of the birth of William Crawford Gorgas before the Lafayette Guild Chapter of the Gorgas Medical Society, University of Alabama, Oct. 3, 1933. His subject was "Medical History." Dr. Hill was made an Honorary Fellow of the Gorgas Society.

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Dr. Herbert U. Williams, professor of pathology in the University of Buffalo, has been granted leave of absence until the middle of March, 1934. He is traveling to the Philippines and East Indies, and will probably visit Egypt, returning to do some teaching in the last term of the school. During Dr. Williams' absence the work in pathology will be directed by a committee from the faculty.

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Dr. Lewis J. Moorman, dean of the School of Medicine of the University of Oklahoma, has been appointed administrative officer of the University Hospital.

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Dr. George Tully Vaughan, professor and head of the department of surgery in Georgetown University School of Medicine since 1897, has resigned. He will be succeeded by Dr. James A. Cahill, Jr., until now professor of clinical surgery.

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Dr. Peter C. Kronfield, associate professor of ophthalmology in the University of Chicago, Division of Biological Sciences, has been appointed head of the department of ophthalmology in Peiping Union Medical College, China.

Dr. Benjamin Goldberg, associate professor in medicine, University of Illinois College of Medicine, was given an honorary professorship in the National University of Mexico.

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Dr. John P. Bowler, dean Dartmouth Medical School, was elected president of the Association of Resident and Former Resident Physicians of the Mayo Clinic and Mayo Foundation.

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Francis L. Landacre, Ph.D., for many years chairman of the department of anatomy at Ohio State University College of Medicine, Columbus, died recently.

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Bradley M. Patten, Ph.D., associate professor of embryology and histology, Western Reserve University School of Medicine, Cleveland, delivered the first Harry Burr Ferris Lecture in Anatomy at Yale University, October 27.

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Dr. Amos C. Michael has been appointed instructor in pathology at Indiana University School of Medicine, Indianapolis.

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Dr. Huntington Williams, commissioner of health of Baltimore, has been appointed professor of hygiene and public health at the University of Maryland School.

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Dr. Robert Marshall Allan, professor of obstetrics and gynecology, University of Melbourne, Australia, is in Baltimore observing the work at Johns Hopkins Hospital and the University Hospital.

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Dr. W. C. Rappleye, dean Columbia University College of Physicians and Surgeons, has now also taken over the directorship of the New York Post Graduate Medical School.

General News

Licensure of Foreign Medical Graduates in California

The following resolutions were adopted by the Board of Medical Examiners of the State of California with regard to the licensure of graduates of foreign medical schools:

WHEREAS, an increasing number of medical students are leaving the United States for the purpose of studying medicine in foreign countries, and

WHEREAS, the standards of medical education in other countries are not always equal to the high standard maintained by approved medical colleges in the United States, and

WHEREAS, it appears from the experience of the California Board of Medical Examiners that it is becoming increasingly difficult to verify the medical credentials of applicants to this Board, who claim to have completed a full course of medical study in some foreign country, and

WHEREAS, the standard of preliminary, premedical and medical educational requirements exacted of graduates of medical colleges is specifically set forth in the medical practice act of the State of California, therefore, be it

RESOLVED that no American student matriculating in a foreign medical school subsequent to the academic year 1932-1933 will be admittted to a written examination for a license to practice under the provisions of the medical practice act of the State of California, who, before commencing his course of medical study, does not secure from some state board of medical examiners in the United States or other competent state authority in the United States, a certificate satisfactory to the Board of Medical Examiners of the State of California showing that, prior to commencing the study of medicine, said applicant has completed at least a one year course of college grade in the subjects of physics, chemistry and biology as set forth in Section 9 of the California medical practice act, and

BE IT FURTHER RESOLVED that no student matriculating in a foreign medical school subsequent to the academic year 1932-1933 will be admitted to examination for a license to practice under the provisions of the California medical practice act, who does not present evidence satisfactory to the Board of Medical Examiners of this state showing that he has fulfilled the premedical educational requirement heretofore mentioned and, in addition thereto, has graduated from a foreign medical school after completion of a medical course of at least four academic years comprising no less than four terms of thirty-two weeks, each totaling 4,000 hours as required under Section 10 of the medical practice act, and

BE IT FURTHER RESOLVED that, in addition to the above mentioned premedical and medical education, each graduate of a foreign medical college who applies for a license to practice as a physician and surgeon in the State of California must present satisfactory evidence to the Board of Medical Examiners of this state that he has obtained a license to practice medicine in the country in which is located the medical school wherein he completed said course of medical instruction, and

BE IT FURTHER RESOLVED that, in addition to the above requirements, any graduate of a foreign medical college, who presents satisfactory evidence to the California Board of Medical Ex-

aminers that he has fulfilled the above stated requirements of premedical and medical education, must, in addition to the above last mentioned requirement, show satisfactory evidence that he has completed the fourth year course in an approved medical school located in the United States and which said hospital is on the approved list compiled and/or published by the Council on Medical Education and Hospitals of the American Medical Association, and

BE IT FURTHER RESOLVED that graduates of approved medical colleges located in the Dominion of Canada shall be exempt from that portion of this resolution relating to the fourth year study in an approved United States medical college, or, in lieu thereof, a two year hospital internship.

Carried.

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For Laboratory Desk Tops

The Kewaunee Manufacturing Co. has developed a paste known as Labtop Seal for the protection of laboratory desk tops against acid and water stains. It is easily and quickly applied with a woolen rag, once a month, affords complete protection and does away with the need for refinishing or repolishing. It will not peel off or flake away from the top and gives a hard, dry, non-sticky working surface.

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Combined Chicago Libraries Catalog

The Board of Governors of the Institute of Medicine of Chicago recently authorized an appropriation of $1,455.00 to compile a combined card catalogue of the literature in the medical libraries of Chicago (John Crerar, Rush Medical College, and the medical colleges of the universities of Chicago, Illinois, Loyola and Northwestern). The plan was organized and the work is being carried out under the supervision of Otto F. Kampmeier, professor of anatomy at the University of Illinois, and chairman of the committee on coordination of medical libraries in Chicago. The union index will be completed in six to eight months, and will be placed in the John Crerar Library because of its central location in the city.

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Transatlantic Broadcast

A competition for the broadcasting across the Atlantic of an American student's impressions of France and of a French student's impressions of America is being organized by Professor Auguste Desclos of the Office National des Universités et Ecoles Francaises and Dr. H. S. Krans of the American University Union in Paris.

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Herzstein Lectures

Stanford University and the University of California take pleasure in announcing the fourth course of the Morris Herzstein Lectures to be given by Herbert N. Evans, M. D., professor of anatomy, and Morris Herzstein, professor of biology and Director of the Institute of Experimental Biology of the University of California. Under the provisions of the will of the late Dr. Morris Herzstein, of San Francisco, these lectures are held in San Francisco under the auspices of the two universities.

Dr. Evans will speak on "The Internal Secretions of the Anterior Lobe of the Pituitary Body." The lectures will be held January 29, 31 and February 2, 1934. The lectures are open to the public as well as to the medical profession.

Book News

Medical State Board Examinations

By Harold Rypins, M. D., Secretary New York State Board of Medical Examiners. J. B. Lippincott Company, Philadelphia. 1933.

The author's experience as a teacher and an examiner of applicants for licensure give assurance of the worth of this book. It cannot fail to be helpful to those for whom it was prepared.

After a critical survey of many thousands of questions used by examining boards of the various states, a selection of typical questions has been made and these immediately follow the review presented in each of the nine major subjects. By placing these questions at the end of the chapters the thought processes of the student will be stimulated and his best interest more fully served than in the older forms of questions and answers.

Aside from its value as a concise review of work done in medical school as a preparation for an examination, this book should prove effective as an aid for a general brushing up on the important phases of every subject in the curriculum. The author deserves the highest commendation for his accomplishment.

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Rose and Carless Manual of Surgery

Revised by Cecil P. G. Wakely and John B. Hunter. American Fourteenth Edition edited by W. T. Coughlin, professor and director of the department of surgery, St. Louis University School of Medicine. William Wood and Company, Baltimore. 1933. Price, $9.

This edition has been especially revised and rearranged to meet American needs. British and American medical school curricula are not the same. Therefore, in this edition, certain subjects suitable and necessary to the British curriculum but superfluous to American requirements, have been omitted. Correlation between clinical and preclinical years is stressed. Copious reference to, and rehearsal of, the anatomy, physiology, pathology and bacteriology involved in each condition is made. The text is intended, apparently, to emphasize for the student the principles and science of surgery rather than its practice and art.

There is much evidence of extensive revision of the previous edition, and much new matter has been added to bring the text up to date. A marked improvement in the mechanical work is the change to a highly surfaced paper which has bettered the definition of the illustrations. Drawings have taken the place of many photographs in previous editions. Despite the addition of much new material, the deletion of unnecessary matter has helped to diminish the bulk of the book.

The arrangement of the text remains the same as before. The splendid 60 page index deserves special commendation.

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The Elements of Medical Treatment

By Robert Hutchison, M. D., London. 2d Ed. William Wood and Company, Baltimore. 1933. Price, $2.00.

This little book is not a complete treatise on medical treatment but merely aims to set out the principles and their application to the commoner forms of disease met with in everyday practice, special attention being given to the prescription of drugs. The book is written in an easy conversational style and is particularly valuable to young physicians, interns, and senior medical students.

The Biochemistry of Medicine

By A. T. Cameron and G. R. Gilmour, respectively Professor of Biochemistry and Professor of Medicine in the University of Manitoba. William Wood and Company. Baltimore. 1933. Price, $7.25.

This book succeeds in rendering the treatment of the biochemistry of pathologic states intelligible. It should prove of value to the student as well as to the practitioner. It is concise and very readable. Numerous references to the literature give opportunity for wider reading by the graduate student.

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Holt's Diseases of Infancy and Childhood

By the late L. Emmett Holt and John Howland. Revised by L. Emmett Holt, Jr. and Rustin McIntosh, respectively, Associate Professor of Pediatrics, Johns Hopkins University, and Carpentier Professor of Diseases of Children, Columbia University. 10th Ed. D. Appleton and Company, New York. 1933. Price, $10.

This work is too well known and the authoritativeness of its revisers too well established to call for more than the statement that it maintains its usual standard of excellence in every way. The revision is thorough and will meet with merited approval.

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Essentials of Prescription Writing

By Cary Eggleston, M. D., Assistant Professor of Clinical Medicine in Cornell University Medical College. 5th Ed. W. B. Saunders Company, Philadelphia. 1933. Price, $1.50.

The almost lost art of prescription writing may be reestablished by making free use of this little book which the student can carry easily in his pocket.

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Surgical Anatomy

By C. Latimer Callander, M. D., Assistant Clinical Professor of Surgery and Topographic Anatomy, University of California Medical School. W. B. Saunders Company, Philadelphia. 1933. Price, $12.50.

This is not a book for the undergraduate medical student unless he intends to specialize in this field and can carry on in it during his elective or spare time. For the graduate it should prove priceless. The more than twelve hundred splendid illustrations are in themselves an insipration. The text is clear and far from being verbose. Mechanically the book is a credit to the publishers.

The anatomy of the organ or region is first considered and then its surgical application is discussed. The principles and anatomy of the commoner operations are discussed and the steps in sequence illustrated. Relationships are stressed.

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The Biology of the Protozoa

By Gary N. Calkins, Ph. D., Sc. D., Professor of Protozoölogy, Columbia University. 2d Ed. Lea & Febiger, Philadelphia. 1933. Price, $7.50.

This book supplies a comprehensive treatise of the fundamental biological aspects of the unicellular animals and a point of view which harmonizes the observations on parasitic forms with the general biology of the free-living types. It presents conclusions based on the author's research on the protozoa covering a period of many years. This work is based on the concept of a changing organization brought about by continued metabolism. In this edition this conception has been amplified in some respects and strengthened and condensed in others. An entirely new chapter on parasitism and disease has been added. The work now fully covers the problem of general vitality and its significance in fertilization. The accompanying phenomena of sex differentiation, maturation, reorganization, adaptation and variations are all treated comprehensively. The illustrations are mainly from the free-living forms. In addition to the regular bibliography there is a special bibliography at the end of each chapter.

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